Electronic Government and Governance in South Africa –
an evaluation of selected national government websites

by
Edgar Mokoena

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Supervisor: Prof J Kinghorn
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Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Opsomming

Elektronies gemediëerde kommunikasie het oor die afgelope 3 dekades fundamentele veranderinge meegebring in die wyse waarop mense, organisasies en regerings kommunikeer – intern sowel as ekstern.

Hierdie tesis pak die taak aan om te probeer vasstel in watter mate die Suid-Afrikaanse regering daarin slaag om die voordele van elektroniese kommunikasie behoorlik te benut.

Omdat elektronika soveel aanwendings het, is die tesis beperk tot slegs die nasionale regering, en slegs tot die mate wat die Wêreldwye Web (WWW) benut word. Die tesis gaan uit van die aanname dat die kommunikasie wat van ‘n regering uitgaan, in beginsel op landsbestuur (‘governance‘) gerig behoort te wees (en nie slegs as ‘n instrument vir self-bekendstelling nie).

Alhoewel daar ‘n baie groot volume van literatuur oor Elektroniese Regering (ER) beskikbaar is, is dit steeds onduidelik hoe om die gehalte daarvan te meet. Verskeie metingsinstrumente is in die verlede gebruik, maar is almal oorspronklik ontwikkel vir kommersiële organisasies.

In hierdie tesis word gekies om ‘n model wat in 2019 ontwikkel is – bekend as die DEWEM – te gebruik as platform vir die ontwikkeling van die metingsinstrument. Die DEWEM is spesifiek ontwikkel om die ‘governance‘ aspek van Elektroniese Regering konseptueel te profileer.

Die tesis vind dat die meerderheid van webwerwe van die Suid-Afrikaanse nasionale regering tegnies en esteties funksioneel is, maar dan gemeet aan Webstandaarde van 20 jaar gelede. Met opmerklik min uitsonderings, benut die regering nie die funksies wat in die WWW in 2020 beskikbaar is nie. Voorts is die vlak van ‘governance’ besonder laag en word die Web hoofsaaklik gebruik as ‘n bekendstelling van nasionale departemente se formele dokumente en persoonlikhede.

Hoofstuk 1 bespreek die problematiek betreffende die meting van regerings se gebruik van elektronika vir landsbestuur doeleindes.

Hoofstuk 2 analiseer die literatuur oor ER dienskwaliteit

Hoofstuk 3 fokus op die literatuur oor ER ‘governance’ kwaliteit

Hoofstuk 4 ontleed die DEWEM raamwerk

Hoofstuk 5 verwerk die DEWEM raamwerk tot ‘n metingsinstrument en pas dit toe op geselekteerde webwerwe van die nasionale regering

Hoofstuk 6 bied die bevindinge aan.

Die tesis lewer nie alleen relatief objektiewe, en literatuur-gebaseerde, bevindinge oor die stand van Web-gebruik in die Suid-Afrikaanse regering nie, maar ontwikkel ook ‘n metodologie vir sodanige evaluerings, wat in die toekoms ook vir ander vlakke van regering gebruik kan word.

Summary

Over the last 3 decades electronically mediated communication has fundamentally changed the way that people, organisations and governments communicate – internally as well as externally.

This thesis aims to determine to what extent the South African government succeeds in utilising the advantages of electronic communication.

Because electronics have invaded all aspects of organisations, the thesis needs to demarcate its attention. It does so by focusing only on national government, and only on government's presence on the World Wide Web (WWW). In doing so the leading assumption is that a government's communication activity ought to aim at achieving sound governance (not only using the web as a tool for self-introduction).

Despite the large volume of literature on Electronic Government (E-Gov) there is still no standardised approach to the measurement of the quality of specific instances. Many evaluation instruments have been used, but all of them are derived from (and customised for) commercial organisations.

In this thesis the choice is made to use a framework that was published in late 2019 – known as the Democratic E-governance Website Model (DEWEM) – as the platform on which the instrument of analysis was designed. The DEWEM was developed specifically as a conceptual framework for the evaluation of E-Gov *governance*.

The thesis finds that the majority of websites of the national government of South Africa are technically and aesthetically functional, but only when evaluated against standards of 20 years ago. With notably few exceptions, no use is made of functionalities that are available in the WWW of 2020. Furthermore, the level of 'governance' is found to be very low, as the websites are used predominantly as sites to portray formal documents and personalities.

Chapter 1 discusses the problematic regarding the measurement of governments' use of electronics for governance purposes

Chapter 2 analyses the literature on E-Gov service quality

Chapter 3 focuses on the literature on E-Gov governance

Chapter 4 profiles the DEWEM framework

Chapter 5 adapts the DEWEM into an instrument of analysis and proceeds to perform the analysis.

Chapter 6 offers the findings

The thesis not only delivers relatively objective and literature-based findings with regard to the use of the WWW by the South African government, but also develops an evaluation methodology that may be used for evaluations of other levels of government in future.

Dedication

The last three years of my life I dreamt of the moment I will write these lines. To once and for all get rid of this burden.

I would thirst like to thank my God for giving me strength and persistence to complete this thesis.

To my supervisor Prof. Johan Kinghorn for always being available to guide me whenever I had a question about my research. He consistently allowed this paper to be my own work, but steered me in the right direction whenever he thought I needed it. Thank you.

To my wife, Boitumelo Mokoena for providing me with unfailing support, continuous encouragement and her unconditional love throughout my years of study and through the process of researching and writing this thesis. Many thanks.

Lastly to my daughter Temoso Mokoena for understating that time spent with her had to be reduced for sake of my studies. I dedicate this achievement to you.

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Abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AWS	Amazon Web Services
CAI	Content Analysis of Interviews
CAS	Content Commentaries on Surveys
CAWS	Content Analysis of Websites
CIO	Chief Information Officer
CS	Case Studies
DEWEM	Democratic E-governance Website Model
DGS	Digital Government Society
DM	Delphi Method
DS	Demand Side
EA	Empirical Analysis
E-DEMOCRACY	Electronic Democracy
E-GOVERNANCE	Electronic Governance
E-GOV	Electronic Government
E-GOVERNMENT	Electronic Government
EGDI	Electronic Government Development Index
E-GOVSQUAL	Electronic Government Service Quality
EPI	Electronic Participation Index
E-S-QUAL	Electronic Service Quality
ES	Empirical Survey
EU	European Union
FAQs	Frequently Asked Questions
FG	Focus Groups
G2C	Government to Citizens
G2C2G	Government to Citizens and Citizens to Government
G2G-AI-C2G	Government to Government, Artificial Intelligence and Citizens to Government
ICEGOV	International Conference on Theory and Practice of Electronic Governance
ICT	Information and Communications Technology
IS	Information Systems

LR	Literature Review
OECD	Organisation for Economic Co-operation and Development
OUR	Open, Useful and Re-Usable
PE	Panel of Experts
QI	Qualitative Interviews
RFID	Radio-Frequency Identification
RSS	Real Simple Syndication
SARS	South African Revenue Service
SERVQUAL	Service Quality
SQ	Service Quality
SS	Service Supply
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum
WQ	Website Quality
WWW	World Wide Web

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Chapter One

The challenge of E-Government evaluation

1.1 Introduction: the aim of this thesis

This thesis is situated in the field of Electronic Government (from now on E-Gov). As will become clear in this and the following chapters it is a multifaceted field comprising sometimes disparate topics.

The aim of the thesis is to navigate through the field toward a position which allows for a credible evaluation of some core aspects of E-Gov in South Africa.

The multifaceted and disparate nature of the field is not evident immediately. At first glance it seems to be a topic that is easily dealt with through technical and functional means. The main questions seem to be whether the electronic mode of communication between a government and the public functions well and whether user satisfaction is achieved. As will be seen in this thesis, a large number of E-Gov publications focus on these aspects. However, on second take it becomes clear that even the technical and functional questions are more complicated than in non-governmental organisations. Because the clientele of a government is the entire public, the demands on its E-Gov systems exceed those that other organisations have to deal with.

But there is more. The reason for the existence of government is to provide *governance.* And the reason for E-Gov is also governance. Although technical and functional aspects of are important, the ultimate purpose of any evaluation of E-Gov should be to determine to what extent a government performs its *governance* function by means of electronic interactions with the public. Do technical and functional applications of electronic communications enhance the

quality of *governance*?

Of course, bad functionality of electronic interactions diminishes government's capacity to execute governance. Technical and functional aspects of E-Gov, therefore, needs full attention in any evaluation. But technical and functional success in itself does not guarantee the quality of the substance of the communication. Unlike the (probably) majority of publications on E-Gov, this thesis, therefore, goes beyond the technical and functional aspects and joins up with those (smaller number) who are looking for credible ways of evaluating E-Gov primarily from the governance perspective.

1.2 A profile of the field of E-Gov research

At least some governments have used computation right from the advent of computers. But as a field of study and praxis the emergence of the internet was pivotal. The internet made computation into a communication tool. By the late 1990's most governments were on-line one way or another and the interest of many different communities were directed to the phenomenon of governments using computation.[1]

The term E-Gov goes back to the late 1990's. More recently there are preferences for the term Digital Government, but there is no clarity in literature on the difference between the two concepts. (To avoid distraction, this thesis uses the notion of E-Gov throughout). Initially the interest came more from practitioners, but in the early 2000's a consolidation of scholarly associations took place and the first scholarly journals devoted partially or totally to E-Gov were launched.[2]

At the same time various governments, the European Union (EU)[3] and other multilateral

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[1] Grönlund, Å., and Horan, TA. 2005. Introducing e-Gov: History, Definitions, and Issues, in *Communications of the Association for Information Systems 15,* Article 39, 713 https://aisel.aisnet.org/cais/vol15/iss1/39

[2] Grönlund and Horan. 2005. Introducing e-Gov. 715

[3] For a particularly comprehensive and wide ranging statement see the EU publication: Electronic Governance ("E-Governance") Recommendation Rec (2004) 15 adopted by the Committee of Ministers of the Council of Europe on 15 December 2004 and explanatory memorandum. https://www.coe.int/t/dgap/democracy/Activities/GGIS/E-governance/Key_documents/Rec(04)15_en.pdf. Among others the document requests member states to "develop an e-governance strategy which:

– fully complies with the principles and domestic organisation of democratic government;

– enhances the effectiveness of democratic processes;

– widens the choices available to users for communicating and transacting with government by providing

organisations began to formalise definitions of E-Gov and incorporating it into their official operations. With the formalisation on the part of governments, an increase in scholarly research, mostly within the confines of scholarly associations is noticeable. By the mid-2000's the topic of E-Gov had become a recognizable field of academic research.[4]

This, however, does not mean that there was a clear focus as to the core of the topic. The term E-Gov comprises so many different aspects[5] that it is best understood as an umbrella term,

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additional channels;

– is based on an inclusive and non-discriminatory approach;

– involves users in strategic choices and respects their needs and priorities;

– ensures transparency and sustainability;

– promotes a coherent and coordinated approach between the different spheres and tiers of government;

– provides a framework for partnership between the public authorities, the private sector and other organisations of civil society;

– maintains and enhances citizens' confidence in democratic processes, public authorities and public services, including through protecting personal data;

– includes solid risk-assessment and risk-management measures;

– enables and improves access to appropriate ICT infrastructure and services that are simple and fast to use;

– ensures system availability, security, integrity and interoperability;

– provides for an ICT policy based on technology neutrality, open standards and on the assessment of possibilities offered by different software models, including open source models;

– contains provisions for broad-based education and training as well as appropriate public information measures;

– takes into account relevant international developments;

– incorporates mechanisms for ongoing evaluation and evolution.

[4] Grönlund, Å and Horan, TA. 2005. Introducing e-Gov.

[5] This is probably best expressed in the UN E-government Knowlegdebase as follows: "

> E-government has been employed to mean everything from 'online government services'' to 'exchange of information and services electronically with citizens, businesses, and other arms of government'. Traditionally, e-government has been considered as the use of ICTs for improving the efficiency of government agencies and providing government services online. Later, the framework of e-government has broadened to include use of ICT by government for conducting a wide range of interactions with citizens and businesses as well as open government data and use of ICTs to enable innovation in governance.
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> E-government can thus be defined as the use of ICTs to more effectively and efficiently deliver government services to citizens and businesses. It is the application of ICT in government operations, achieving public ends by digital means. The underlying principle of e-government, supported by an effective e-governance institutional framework, is to improve the internal workings of the public sector by reducing financial costs

rather than a coherent field. As will be further discussed in chapter 2, the situation has not changed much since then. If anything, the development of more technologies (such as mobile and AI capacities) and their integration into the internet, means an even more scattered range of research that is bundled together under the umbrella of E-Gov (or Digital Government) today. Furthermore, literature in this field comes from an even wider spectrum of disciplines and interest groups as actual E-Gov reaches further and further into public life.

Although it can be said that formal E-Gov is only 15 years old, the volume of literature on the subject is vast. For *only* the period 2017 to May 2020 the Stellenbosch University Library lists no less than 140 290 entries for peer reviewed articles containing the search items "Electronic/ Digital government".

The majority of these can be characterised as practitioner orientated or simply observational. However, attempts are being made to develop more substantive, theoretically grounded paradigms for the field. The main associations that serve at present as platforms for such attempts are Digital Government Society (DGS)[6] and International Conference on Theory and Practice of Electronic Governance (ICEGOV).[7] Another platform with a similar focus is the Organisation for Economic Co-operation and Development (OECD), although the ultimate aim

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and transaction times so as to better integrate work flows and processes and enable effective resource utilization across the various public sector agencies aiming for sustainable solutions. Through innovation and e-government, governments around the world can be more efficient, provide better services, respond to the demands of citizens for transparency and accountability, be more inclusive and thus restore the trust of citizens in their governments."

[6] DGS was formed in 2006 and defines itself as follows: The Digital Government Society (DGS) is a global, multi-disciplinary organization of scholars and practitioners interested in the development and impacts of digital government. Digital government fosters the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services. DGS equips its members with a professional support network focused on both scholarship and effective practices that nurture technical, social, and organizational transformation in the public sector. http://dgsociety.org/about/

[7] ICEGOV defines itself as follows: ICEGOV stands for *International Conference on Theory and Practice of Electronic Governance*. Established in 2007, the conference runs annually and is coordinated by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV). Part of the United Nations University and headquartered in the city of Guimarães, north of Portugal, UNU-EGOV is a think tank dedicated to Electronic Governance; a core centre of research, advisory services and training; a bridge between research and public policies; an innovation enhancer; a solid partner within the UN system and its Member States with a particular focus on sustainable development, social inclusion and active citizenship.
http://www.icegov.org/about/

of the OECD is practical implementations. A whole section of the Directorate for Public Governance is devoted to Digital Government and features both theoretical and empirical country studies[8]. These studies are important because, as a research and policy support to the leading economies in the world, the OECD sets agendas that are not to be ignored. There is also clear cross pollination between the mentioned academic associations and the OECD as well as the United Nations through the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the *UN E-Government Knowledgebase*[9].

1.3 The dream of the fruits of E-Gov praxis

Over the years the dream of the fruits of E-Gov has been formulated in numerous publications. As Al-Kaabi and Hattab said more than a decade ago: "The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions".[10]

A short list of anticipated benefits includes:

(a) Anytime anywhere (24/7) [11]/[12]

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[8] The OECD defines its interest in the topic as follows: Our work on digital government explores how governments can best use information and communication technologies (ICTs) to embrace good government principles and achieve policy goals. https://www.oecd.org/gov/digital-government/

[9] UN E-Government Knowledgebase https://publicadministration.un.org/egovkb/en-us/About/UNeGovDD-Framework

[10] Al-Kaabi and Hattab. 2009. E-Government success factors: A survey. 39

[11] Imbamba & Kimile. 2017. A review of the status of e-government implementation in Kenya. 20. "Services can be rendered through mobile phones, social media, and open access facilities like local digital centres among other initiatives".

[12] Kumar et al. 2017. A qualitative approach to determine user experience of e-government services. 304. "Citizens can now experience government offices in their own homes by accessing public services from their laptop/desktop/smartphone or similar devices"

(b) Free flow of information [13]/ [14] / [15]

(c) Reaching more people more cost effectively [16]

(d) Improving government effectiveness through Big Data [17]

(e) Improving openness, trust, and transparency [18]

(f) Unlocking economic opportunities [19]

(g) Business process improvement [20]

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[13] Evans & Yen. 2006. E-Government: Evolving relationship of citizens and government, domestic, and international development. 231. "E-government represents the free flow of information that improves knowledge, opportunity, relationships, time effectiveness, and encourages the standardization of products and ideas because citizens view a common set of information".

[14] Peng et al. 2014. Public participation and ethical issues on E-Governance: A study perspective in Nepal. 84. E-government can serve a variety of different ends, "such as better delivery of government services to people, improved interaction with business and industry, citizen empowerment through access to information….".

[15] Imbamba & Kimile. 2017. A review of the status of e-government implementation in Kenya. 21. "In accordance with a citizen's right to information, the open government data portals enable end-users to locate data sets about sectors like education, health, agriculture, finance, social welfare and environment. This results in improved public policymaking and informed publications".

[16] Joshi & Islam. 2018. E-Government maturity model for sustainable E-Government services from the perspective of developing countries. 9. "Social media, such as Facebook, Twitter, YouTube, and LinkedIn are suggested as effective approaches to reaching an increased number of stakeholders".

[17] Kosorukov. 2017. Digital government model: theory and practice of modern public administration. 8. "The introduction of big data helps to build a more effective model of public administration which expand the channels for citizen participation. In addition, large data enable effective monitoring of the state programmes and provide possible warning errors for targets that are not going to be met".

[18] Helbig & Gil-Garcia. 2007. Exploring E-Government benefits and success factors. 804. "E-government initiatives promote accountability and public participation".

[19] United Nations. 2014. E-government survey 2014: E-government for the future we want. 2. "E-Government can help governments go green, promote effective natural resource management, stimulate economic growth and promote social inclusion". And: The United Nations believes that “E-government can generate important benefits in the form of new employment, better health and education”.

[20] Misra. 2006. Defining E-Government: a citizen-centric criterion-based approach. 4. "1. Reduced time in setting up a new business (reduced red tape), 2. Conducting e-business and e-commerce (online business), 3. Better conformity to government rules and regulations for running the business, 4. More convenient and transparent ways of doing business with government through e-procurement, 5. Better control over the movement of goods through online monitoring of clearances, and 6. Conducting monetary transactions online (e-banking, e-payment)".

(h) Better service delivery [21]/ [22]

(j) Reducing government operational costs [23]

Of course, various challenges affect electronic government. Chief among them are infrastructure development, law and public policy, the need to change the way public services operate, old[24]/ [25] and new forms of digital divide[26]/ [27]/ [28] and the need to develop e-literacy.[29]/ [30] But none of these are considered insurmountable any more. E-Gov has come to stay and the question is how to make it work best.

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[21] Helbig & Gil-Garcia. 2007. Exploring E-Government benefits and success factors. 804. "E-government allows government to provide services [more] intelligently and effectively".

[22] Mutula. 2008. Comparison of sub-Saharan Africa's e-government status with developed and transitional nations. 236. "E-Government is aimed at cutting costs and improving government efficiency, meeting and improving citizen expectations and relationships, and facilitating economic development".

[23] Strielkowski et al. 2017. Modern Technologies in Public Administration Management: A Comparison of Estonia, India and United Kingdom. 182. "Modern technologies might save millions for public administration budgets around the world and they seem to be very appealing and attractive for both young and old citizens".

[24] Belanger & Carter. 2006. The effects of the digital divide on E-Government: An empirical evaluation. 2. "A lack of access to the Internet is a major element of the digital divide".

[25] Harfouche & Robbin. 2015. Definitions of E-Government. 9. "Serious access divide exists between citizens of developed and developing countries".

[26] United Nations. 2018. E-government survey 2018: Gearing e-government to support transformation towards sustainable and resilient societies. 34. "The 'digital divide' was once considered to be a lack of access to the Internet and hardware, such as computers, phone, and mobile devices. But access such as access to mobile phones has improved through technological progress and affordability. However, new digital divides have emerged, such as the speed and quality of those devices, and in digital literacy or the know-how to use them".

[27] Harfouche & Robbin. 2015. Definitions of E-Government. 9. "Citizens in developed countries demonstrate much greater acceptance of and experience greater satisfaction with government e-services".

[28] Park. 2017. The Fourth Industrial Revolution and implications for innovative cluster policies. 437. "The Fourth Industrial Revolution also creates negative aspects at a broad level. The embeddedness of the Internet affecting our lives in the next industrial revolution era will enhance the growing level of inequality that has existed as socioeconomic trends. The reason for it is that more than one-half of the world population has no access to the Internet in 2015".

[29] Peng et al. 2014. Public participation and ethical issues on E-governance: A study perspective in Nepal. 85

[30] Imbamba & Kimile. 2017. A review of the status of e-government implementation in Kenya. 25

1.4 The research problem: design, demarcation and significance

The disparity and multifaceted character of the field of E-Gov (to be further demonstrated in chapters 2 and 3) plays a crucial role in the demarcation of the research problem of this thesis. The following factors had to be considered:

a) How governments utilise electronic technologies involves not only communication to the public via the internet, but also internal communications systems, data management and organisational and workflow restructuring made necessary by the emerging technologies. Clearly, a comprehensive profiling of all of this – even if only for national government – is an undertaking that is not achievable in one study, and certainly not at Master's level.

b) From the beginning it was, therefore, decided that the research would focus on a single facet of E-Gov. This was the *public presence of National Government via the internet.*

c) To ensure coherence in the study, and to make it manageable in scope, a further demarcation was necessary. This was done by restricting the unit of analysis to government's public presence via the World Wide Web (WWW). In practice, therefore, this thesis restricts itself to websites of national governmental departments.

d) When the research for this thesis started in 2014 the penetration of social media was still rather low in South Africa. The bulk of the population did not have access to "smartphones". Now, in 2020, the situation is different. However, a study of governmental use of social media would require a completely different research methodology and practice. This thesis, therefore, takes note where appropriate of the use of social media, but does not further investigate such communications.

e) The initial objective was to answer the question how the South African government's WWW presence compared in international perspective. Soon, however, a serious hurdle emerged. One of the results of the disparity of the field of E-Gov is that no generally accepted measurement framework existed. This meant a shift from the objective to evaluate existing websites to developing a reasonably credible measurement framework and instrument.

f) A range of measurement instruments copied from studies of corporate and other business websites were of course available. In fact, chapter 2 will demonstrate that the majority of studies in the field of E-Gov on governmental websites employ such tools. But, as stated in 1.1 such evaluations are restricted to technical functionality. It leaves out the question whether the technical means contribute to government's core function of governance.

Although useful, such analyses effectively merely measure government against business organisations.

g) Since 2017, however, welcome additions to the corpus of literature have been made by a number of publications which actively seek to establish an overarching systemisation and synthesis in the area of website analysis. The thesis benefitted greatly from this move in the scholarly community as it made the construction of a reasonably objective measurement instrument, with solid roots in iterature, possible.
This thesis identified 3 such research articles. They form the theoretical platform for the development of the instrument of analysis used in this thesis (discussed in chapter 4). All three offer rigorously researched (though using different methods) literature analyses with the objective of synthesising the vast literature into more coherent profiles of the field.

h) It is also gratifying to note an increased insistence in literature on the necessity to focus on E-*governance* as being the core of E-Gov. It does not seem to be the majority position yet, but recent publications along this line seem to be on the increase.

i) However, and understanding of E-Gov as *either* technical *or* governance focused is incorrect. Without the technical there can be no E-Gov at all. The emphasis on governance must, therefore, be understood as an extension of the technical to incorporate an assessment of the impact of a particular technology on the nature and scope of (enhanced) governance. In short, E-Gov is both technique and governance.

Against this backdrop the research problem of this thesis can be formulated as:

> *the construction of an appropriately objective instrument to evaluate a government's use of the WWW in pursuit of good governance, and the application of this instrument to a select number of national departments in South Africa.*

For the academic community the significance of this thesis lies in the further development and practical application of a recently published analytical tool designed to evaluate E-governance.

For the South African government, the significance lies in the findings of the evaluation, now that there is a renewed emphasis by government on the maximum utilisation of electronic technologies.

1.5 Methodological considerations

The thesis predominantly combines Textual[31] and Content Analysis, more specifically Directed Content Analysis[32].

The thesis draws mainly on research publications which are the result themselves of a combination of the two methods.

In the development of the measurement instrument a further step is taken in line with Directed Content Analysis theory. The application of the instrument, as well as the interpretation of the findings are done in the mode of Textual Analysis, where the website is examined as a text containing written language, visual images and potentially video and sound presentations.

1.6 Limitations

The field of E-Gov has not reached maturity. Much of the available literature contains an element of experimentation. This thesis, therefore, cannot escape its own element of experimentation.

The study of websites is at the best of times a study of moving goal posts. It is the nature of the medium that constant changes are made, changes of content but also structure. Any interpretation of a website is valid only on the day it is done.

The changes in websites are also a consequence of organisational decisions to change the backroom technology which is not necessarily evident on the surface. A full assessment of a website should include an analysis of such technology, but this is normally confidential.

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[31] Hawkins. 2018. Textual Analysis, in Allen M, *The SAGE Encyclopedia of Communication Research Methods*. SAGE: Thousand Oaks describes Textual analysis as:

"a methodology that involves understanding language, symbols, and/or pictures present in texts to gain information regarding how people make sense of and communicate life and life experiences.... Data are gathered and analyzed to provide deeper understanding through description and interpretation of messages found within the text (or across texts)."

[32] Hsieh and Shannon. 2018. Content Analysis, in Frey BB *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. SAGE: Thousand Oaks define Content Analysis as:
"an analytic method used in either quantitative or qualitative research for the systematic reduction and interpretation of text or video data.... The aim of content analysis is to describe data as an abstract interpretation.... When prior research or theory exists and the purpose of the research is to confirm, expand, or refine this existing understanding of a phenomenon, a more deductive approach or directed qualitative content analysis is appropriate using existing knowledge or theory to build the initial coding structure.... With a directed content analysis approach, the researcher develops an initial coding scheme from existing theory or knowledge, using the data to modify or expand these codes."

Chapter Two

E-government as Service

2.1 Introduction

This chapter reports on the literature review on E-government service quality research that was undertaken for this thesis. For the purpose of the review no distinction was made between E-government and Digital government. In literature these concepts are often used interchangeably, although in some cases clear distinctions are drawn.

As was stated in chapter 1, the focus of this thesis is on *evaluating the state* of E-government (in particular in the mode of the Web presence of selected departments) in South Africa) For that reason, the literature review was not done with the purpose of profiling E-government (E-Gov) in all its dimensions. The question guiding the review was what methodologies and models to determine E-government quality were available in literature?

As will be shown in the next section, a perusal of literature shows a lack of coherent approaches and methodology. In fact, relatively few publications reflect purposefully on the objective of the field of study and as a consequence on suitable methodological approaches. The next section elaborates extensively on this, by tracing the research and its findings by Arias and Maçada.

This is followed by an overview of the OECD model for an "ideal" E-government practice.

The chapter concludes with summaries of South African publications on E-government, after which general conclusions are drawn.

2.2 Arias and Maçada: the unfinished business of E-Gov service quality research

The 2018 paper by Arias and Maçada[33] at ICEGOV'18 provides an extremely valuable literature review on the fragmented situation with regard to research into the quality of E-government. Because of the scope of their research and the direct significance of their findings for this thesis, it is necessary to provide a complete summary. Their research and findings play an important role in the design and focus of this thesis.

2.2.1 Summary of: Digital Government for E-Government Service Quality: a Literature Review

The purpose of their research was to "synthesise related work in the field of e-Government service quality". This was necessary because although "recently" there was a spate of attempts to develop models for service quality assessments, "none of these articles builds on each other. In fact, the authors do not even cite each other, thus failing to recognize the accumulated knowledge in the field of e-Government service quality…. Hence, we realized there is an abundance of literature on e-Government service quality that has not been systematically structured."[34]

To the question why such a situation of fragmentation and lack of integration exists, Arias and Maçada answers: "The e-Government field of knowledge: 1) Does not have journals exclusively devoted to literature review articles; 2) Is a relatively young field of study; 3) Is an interdisciplinary field colonized by researchers from different disciplines, who bring with them their various accumulations of knowledge and theories from several areas; and 4) Has few theories of its own."[35]

Against this backdrop the research "tries to answer two questions, 1) How have researchers studied Information systems (IS) impact on public service quality? and 2) How has the dependent variable public service quality been defined and operationalized in terms of independent variables so as to measure IS impact on it?"[36]

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[33] M. Isabel Arias, A. Gastau Maçada. 2018. Digital Government for E-Government Service Quality: a Literature Review. In *Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance (ICEGOV'18)*

[34] Arias and Maçada. 2018. Digital Government for... 7

[35] Arias and Maçada. 2018. Digital Government for... 8

[36] Arias and Maçada. 2018. Digital Government for... 8

Arias and Maçada engaged in a very rigorous process of identifying publications that answered to their questions. Starting with the Web of Science they followed backward and forward methods of scanning all major Information Systems journals and then broadening into any type of conference proceeding and journal focusing on service quality, they identified 69 papers dating from 2002 to 2016.

After an initial content analysis, the number of articles were reduced to 48. This was done on the basis that such articles all proposed models of assessment in which E-Government service quality was the dependent variable contingent on a variety of independent variables. Thereafter they were clustered into 28. The reduction was made on the basis of cross fertilisation between certain authors and publications. The resulting 28 represented investigations that were independent of each other. Further content analysis was done on the 28 independently classified group of articles.

Below is an excerpt from a table (showing 8 of the 28 groups) in which the authors have presented the framework of their classification and some of the findings[37].

No	Author(s)	Dependent variable	Scope of application [Context]	Research procedures	
1	Agrawal et al. [2,3] Agrawal [1]	E-governance online-service Quality	SQ DS [India]	LR MD FG QI	PE QD ES
2	Alanezi et al. [4,5]	E-government service quality	SQ DS [Saudi Arabia]	LR MD QD QI	CAi
3	AlBalushi and Ali [6]	Quality of e-Government Services	SQ DS [Oman]	LR DC	
4	Barnes and Vidgen [9,11,12]	Users' overall perceptions of the site's web Quality	WQ DS [UK]	ES CAs	
5	Bhattachary et al. [15]	E-service quality in e-Government	WQ DS [India]	LR MD QI	QD ES
6	Bouaziz et al. [16]	E-service quality in e-Government Portals	WQ DS [None]	LR MD QD	
7	Chua et al. [19]	Quality of Government Websites	WQ DS [40 nations]	LR MD CAws	

[37] Arias and Maçada. 2018. Digital Government for... 10

8	Connolly et al. [22]	Government Website service quality	WQ DS [Ireland]	LR MD QD	ES

Table 2.1: Summary of Extant Literature on E-Government Service Quality

The abbreviations are to be understood as follows:

The scope of application (column 3) was categorized following a framework created by Fath-Allah et al.[38] in which distinctions are made between website quality (WQ) and service quality (SQ), as well as supply (SS) or demand side (DS). In practice these are distinctions between the technical quality of a website and the content quality, as well as whether the focus of analysis was on governmental input or citizen expectations. The context refers to the country where the final empirical analysis was conducted.

Research procedures (column 4) are classified using a framework by Hofmann et al.[39] who distinguish between: quantitative empirical survey (ES); empirical analysis (EA); literature review (LR); content analysis of websites (CAws); content commentaries on surveys (Cas) or interviews (Cai); qualitative interviews (QI), focus groups (FG), panel of experts (PE), Delphi method (DM), and case studies (CS).

The research also found no less than 95 independent variables that were used in total to evaluate e-government service quality. The full list is as follows[40]:

No	Independent variable	No	Independent variable
1	Accessibility	49	Management
2	Accountability	50	Navigability
3	Aesthetics/minimalist Design	51	Navigation
4	Appealing website	52	Organization quality
5	Assurance	53	Overall service quality
6	Availability	54	Performance
7	Back-end	55	Performance efficiency
8	Citizen centricity	56	Personalization
9	Citizen involvement	57	Portability
10	Citizen participation	58	Privacy
11	Citizen support	59	Procedural
12	Communication	60	Process Quality
13	Compatibility	61	Readability

[38] Fath-Allah, A., Cheikhi, L., Qutaish, R. E. Al and Idri, A. (2014) A Comparative Analysis of E-Government Quality Models, *International Journal of Social, Behavioural, Economic, Business and Industrial Engineering*

[39] Sara Hofmann, Michael Räckers, and Jörg Becker. 2012. Identifying Factors of E-Government Acceptance – A Literature Review. *In Proceedings of the Thirty-Third International Conference on Information Systems*

[40] Arias and Maçada. 2018. Digital Government for... 13

14	Compensation	62	Recognition instead of remembrance
15	Complete information	63	Reliability
16	Consistency and patterns	64	Resourceful
17	Contact	65	Responsiveness
18	Content	66	Satisfaction
19	Content/website design	67	Security
20	Context coverage	68	Security and privacy
21	Convenience	69	Service agility
22	Customer care	70	Service content
23	Ease of Completion	71	Service delivery
24	Ease of interaction	72	Service interaction
25	Effectiveness	73	Service quality
26	Efficiency	74	Services
27	Empathy	75	Services
28	E-participation	76	Site aesthetics
29	Error prevention and Diagnosis	77	Site compatibility with real life
30	Error preventions	78	Site design
31	External	79	Status system
32	Features	80	System Availability
33	Freedom from risk	81	System function
34	Front-end web design	82	System quality
35	Fulfilment	83	Tangibles
36	Functional quality	84	Technical
37	Functional suitability	85	Technical adequacy
38	Functionality	86	Transaction transparency

Table 2.2: Independent variables

2.2.2 The Arias and Maçada findings

The study draws a number of conclusions which are of direct importance to this thesis.

Firstly, and perhaps the most important finding by Arias and Maçada is that the majority by far of the investigations employ theoretical frameworks that are drawn from business, Information Systems and in particular e-commerce domains. These are sometimes augmented by technology adoption models, information systems success models and ISO standards[41]. The two instruments that are mostly used are service quality (SERVQUAL) and its later adapted offspring electronic service quality (E-S-QUAL).

SERVQUAL[42] dates back to the mid 1980's. SERVQUAL was introduced by its creators as "a 22-item instrument for assessing customer perceptions of service quality in service and retailing organizations."[43] The instrument revolves around 5 dimensions that were expressed

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[41] Arias and Maçada. 2018. Digital Government for... 11

[42] Parasuraman, A; Zeithaml, Valarie A; Berry, Leonard L. 1988. SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing 64, 1*

[43] Parasuraman et al. 1988. SERVQUAL: A Multiple-Item Scale for…12

as follows:

Tangibles: Physical facilities, equipment, and appearance of personnel

Reliability: Ability to perform the promised service dependably and accurately

Responsiveness: Willingness to help customers and provide prompt service

Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence

Empathy: Caring, individualized attention the firm provides its customers[44]

E-S-QUAL[45] was published in 2005 as an attempt to adapt SERVQUAL to an electronic environment. The introductory article described it as follows: "Using the means-end framework as a theoretical foundation [E-S-QUAL is] a multiple-item scale for measuring the service quality delivered by Web sites on which customers shop online."[46] The scale revolves around the six dimensions of: efficiency, system availability, fulfilment, privacy and perceived value and loyalty intentions.[47]

A *second* important finding relates to the methodological incoherence in most of the studies. Say Arias and Maçada:

> "17 out of the 28 investigations … did not explicitly define the dependent variable of the study. Both in journals and conference proceedings explicit definitions are missing….
>
> This may be justified in the case of early investigations in the area because e-service quality research was still in its infancy and the limited amount of assessment of e-Government service quality remained a major weakness. However, after more than 10 years since these studies have been developed, we believe that the lack of explicit definitions should be overcome. Researchers must explicitly define the variables that are part of their models … because higher levels of conceptual clarity are necessary to

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44 Parasuraman et al. 1988. SERVQUAL: A Multiple-Item Scale for…23

45 Parasuraman, A; Zeithaml, Valarie A; Malhotra, Arvind. 2005. E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research 7, 3*

46 Parasuraman, et al. 2005. Assessing Electronic Service Quality... 213

47 Parasuraman, et al. 2005. Assessing Electronic Service Quality... 224ff

define e-Government projects."[48]

Thirdly, 22 out of 28 investigations focus exclusively on the "demand side". The remaining studies concern themselves with the "supply side" only. This comprises studies of the role of the Chief Information Officer (CIO) and technical analyses of website quality from the perspectives of developers.

Given the heavy reliance on user experience and expectations, it is understandable that a combination of literature reviews, surveys and qualitative approaches dominate the preferred research methods.

2.2.3 Implications of the Arias and Maçada findings for this thesis

The findings of the above study raise some concerns that this thesis considers in devising its own research approach.

1. The reliance on general service quality theory and applications such as SERVQUAL, can only be uncritically accepted as long as Government is seen as (just another) organization with offerings to the market. If that is the case, the compound electronic government does not express a unique relationship between the "supplier" and "demander". By adding 'government' to 'electronic' it, then, simply locates the functioning of e-commerce to a specific vendor.
   But government is not just another organization. The purpose of government is neither to service society, nor to market itself and its products as efficiently as possible. Until the uniqueness of government among all the organs of society is taken seriously, the notion of E-government is incomplete. This to say that the notion of E-government ought to cover how *governance* is mediated by means of the opportunities that electronic systems provide. Governance is far more than mere service and E-government is far more than user satisfaction.
2. The literature profile of E-government research that the Arias and Maçada study presents clearly shows and interest that is restricted to "consumability". In the list of 95 independent variables, a maximum of 6 can be interpreted as focusing on citizens' duties and responsibilities.
   In the relation between a government and citizens in a democratic society, the interaction between the two is inherently equal and two-way. Citizens do not only

[48] Arias and Maçada. 2018. Digital Government for... 12

"consume" and receive services, they also contribute to government in many ways; they also have to execute responsibilities and perform duties toward government. In fact, such citizenship is essential to 'government'.

E-government research which does not inculcate the reciprocal relationship between government and citizens, must be questioned. This means that a conception of E-government which honours the nature of the unique relationship between content and user will be, in the terminology of Arias and Maçada, one which attempts to capture both "supply" and "demand" as well as the relationship between them.

This thesis responds to this challenge by defining the independent variables as a set of governance values which govern both government and citizens. The question is then to what extent the use of electronic means reflects and promote such values. This, it is proposed in this thesis, makes E-government a different field of discourse from Information Systems and business service studies.

3. The above does not imply that measuring service quality is wrong per se. The electronic dimension is an essential part. But this thesis argues that the interest in technical systems and user experiences and anticipations must be subjected to the overriding focus on governance values. This thesis is not alone in taking such a stand. In the next chapter the integration of governance perspectives with electronic systems will be further investigated.

2.3 Previous South African studies on service quality

South African studies related to the topic of this thesis are not recent. They are discussed in chronological order.

2.3.1 Korsten and Bothma 2005 [49]/[50]

Research for the two articles was done in 2001. This was right at the beginning of a world-wide interest in using the Web by governments.

The research started with the compilation of website assessment criteria. This was done by

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[49] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites: methods, findings and recommendations (Part 1), *South African Journal of Information Management,* 7/2

[50] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites: methods, findings and recommendations (Part 2), *South African Journal of Information Management,* 7/2

means of a literature review. The criteria:

> "demonstrate that the crucial element of an effective Web presence is content that is comprehensive, current, of high quality and authoritative, that is well written, caters for the need of a wide range of audiences and which fulfils the publishing institution's communication and information dissemination objectives: …that good Web site content should be enhanced by developing a Web site that is easy to use, offers easy and intuitive movement through the Web site, and where information is easy to find through both the browsing and searching behaviour of users. Lastly, [a Web site should have] a visually attractive look and feel that does not distract from the content or functionality but enhances information and service delivery through visual and functional continuity."[51]

With this in mind the assessment of *The South Africa Government Online* website was carried out from August 2000 to March 2001 by applying heuristic evaluation, user testing and an online survey. Not surprisingly the study found "that respondents had a negative perception of the standard of government Web publishing in general, and that these perceptions influenced their perceptions of the South Africa Government Online Web site negatively."[52]

As a follow-up the study was extended to 26 other government websites. This was done during February and March 2001. The findings corresponded with the earlier study of *Government Online*. It is necessary to quote these findings in full:

> "It was clear from the findings of the audit that, although the majority of South African government departments had started to embrace the Internet for information dissemination, government Web sites generally did not conform to the basic principles of good Web site design.
>
> Inadequate information provision as well as lack of currency of Web sites contributed to insufficient access to government online information. Web sites also varied significantly in the extent to which information was made available – there was a disparity with regard to the breadth as well as depth of information. Furthermore, strong emphasis was placed on the presentation of departmental organizational structures and activities, and especially the provision of documents, speeches and media statements, in contrast to the presentation of projects and programmes and value-added features such as Frequently

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[51] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites (Part 1), 5

[52] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites (Part 2), 2

Asked Questions (FAQs), site maps, indexes and interactivity features. Some government departments started to provide some services online, but they were still far from becoming true online service providers at the time of the audit.

Another important concern was the difficulty users experienced in finding information. Factors contributing to this included all aspects audited, from the unavailability and lack of currency of information, poorly planned information architecture and navigation schemes, to the design and layout of pages. The lack of consistent design and organization of information across government Web sites contributed to the lack of coherence and unity in the national Web system." [53]

The study comes to the conclusion that:

"much still has to be done to have government Web sites that are professional, usable and effective and which are effectively sustained…. The challenge to improve South African government Web publishing falls into three broad groupings of activities, namely:

- improving the content, architecture, navigation and design of Web sites developed by individual government institutions;
- improving the quality and effectiveness of the South Africa Government Online Web site as a gateway or portal to online
- government information; and developing and implementing overarching mechanisms in government to ensure co-ordination and a uniform approach to government Web publishing in South Africa."[54]

2.3.2 Kaisara and Pather 2011

The work of Kaisara and Pather[55] is one of the 28 investigations analysed by Arias and Maçada.

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[53] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites (Part 2), 3

[54] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites (Part 2), 3

[55] Kaisara & Pather. 2011. The e-government evaluation challenge: A South African Batho Pele-aligned service quality approach. *Government Information Quarterly*.

Compared to the studies by Korsten and Bothma it demonstrates how much more sophisticated e-government studies in general, and in South Africa in particular became since the early 2000's.

The primary aim of Kaisara and Pather was "to derive a generic instrument that captures the e-Service quality construct in e-Government websites and which also is aligned to South African principles of Batho Pele."[56] To achieve this, the authors do an extensive literature review of e-government service quality, in particular with reference to the well-known DeLone & McLean Information Systems Success Model. Against that background a two-phased research project was done. The first phase consisted of a series of focus groups during 2008 who were given tasks to perform on the *Cape Gateway* portal. From these a set of e-Service quality dimensions were derived.[57] In the second phase an online survey was used to test the reliability of the identified e-Service dimensions. In total 6 dimensions proved to be reliable.

The next step was to look for alignment with the Batho Pele principles. The Batho Pele is made up of 8 principles, namely: consultation, setting service standards, increasing access, ensuring courtesy, providing information, openness and transparency, redress, and value for money.[58]

Kaisara and Pather conclude that "the traditional service objectives set out in the Batho Pele framework, which inform the ethos of government service delivery, may not in its entirety be applicable to a web-enabled environment."[59]

Nevertheless, there is a significant and useful correlation between the objectives of Batho Pele and generic service quality measurements. On this basis they construct the electronic government service quality (E-Gov SQual) instrument.[60] This instrument is set out on the next page.

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[56] Kaisara and Pather. 2011. The e-government evaluation challenge... 217

[57] Kaisara and Pather. 2011. The e-government evaluation challenge... p215

[58] Kaisara and Pather. 2011. The e-government evaluation challenge... p213

[59] Kaisara and Pather. 2011. The e-government evaluation challenge... p219

[60] Kaisara and Pather. 2011. The e-government evaluation challenge... p218

e-GovSqual instrument items.

e-SQ dimensions (Batho Pele equivalence)	Consider your interactions with the XYZ website. How important is it that…
Website design (value for money)	…the web pages load quickly …you are able to download documents easily and quickly …the sizes of downloadable documents are kept as small as possible …there are no broken links to other pages in the website …online forms are to the point and easy to complete …application forms for services can be completed and submitted online …application forms for services (e.g. registration of births) are available online for downloading …the website recognizes you from previous sessions and thus is able to display customized content for your needs
Navigation (value for money)	…direct links to other government websites are available …a search facility is available that is able to direct me to any government resources whether it is local, provincial, or national …the website search engine should rank the results according to relevance of your query
Site aesthetics (value for money)	…the website design is simple and attractive …pictures are clear and in color …there is no private/commercial marketing on government websites …there are no pop-ups
Information quality (providing information, ensuring courtesy, value for money, openness, and transparency)	…the volume of information on web pages is kept at minimum levels …information is clear and unambiguous …information on government tenders is available online …the information is comprehensive and complete and you do not have to search further to answer your query
Security (value for money)	…the use of the website instills a feeling of trust with government …a security policy is clearly stated on the website to assure you of your data security
Communication (providing information, increasing access, openness and transparency; ensuring courtesy and value for money; setting service standards, offering redress)	…government officials respond to your emails in a timely manner …you are allowed the flexibility to use the official language of your choice …the website contains simple and easy to understand language …the government website makes a clear posting of the service standards that you are entitled to as a citizen …government provides real-time on new developments …a platform such as an electronic discussion group is provided on the website for citizens to debate issues of interest …the contact details of relevant government officials are clearly posted …more than one type of communication detail for a government department is available, e.g., email, voice over internet protocols …contact details are grouped in a single page, with a clear link to this page …the full names and all contact details of government managers in charge of specific services are provided

Table 2.3: e-GovSqual instrument items

2.4 Conclusions and implications

This chapter provided an overview of selected literature with regard to the theme of E-government.

It shows that notion of E-government is usually associated with an interest in the service quality of governments' electronically mediated communications with citizens. As service quality models have been produced predominantly for the purpose of businesses to evaluate the effectiveness of their Web profiles, most E-government studies build on service quality standards that assume a supplier-consumer relationship.

However, it was noted that in a democracy the relationship between government and citizens cannot be reduced to a purely business relationship. This is partially illustrated by the data-driven model propagated by the OECD, where there is a continuous flow of data in both directions between government and citizens, with each performing a critical as well as a creative role.

That the evaluation of government's use of ICT cannot only be one of a functional and service nature, is also underlined by Kaisara and Pather's attempt to infuse into service quality (some) normative factors as formulated in Batho Pele.

Therefore, without minimising the need for technically highly functional, aesthetically pleasing and user-friendly websites, it must be said that a government's web presence which is measured only on these terms are not sufficient. Assessing a government's web presence must start form the recognition that it is the presence of *government.* It must, therefore, make *governance* present in electronic format.

The next chapter investigates governance further.

Chapter Three

E-Government as Governance

3.1 From 'service' to 'governance'

Where the previous chapter profiled the state of E-Gov research when the focus is on the technical functionality of service delivery via the WWW, this chapter shifts the focus to E-Gov as *governance.*

The literature on E-GOV as electronic governance (E-governance) is no less fragmented and uncoordinated as on service quality. Fortunately, as was the case in the previous chapter, a recent publication by Bindu, Sankar and Kumar offers a very useful attempt to synthesize publications in the field, based on a very rigorous network analysis. The chapter starts with an overview of their work.

However, as was noted before, E-Gov from the perspective of governance requires the scope of attention to go beyond the technical functionality of a website. Viewing it from the point of governance the website becomes an expression of the organisation of government, in particular its values. This point is taken up in a number of publications, but also by international organisations such as the UN, the OECD and the EU. The second part of this chapter, therefore, offers a scan of the positions taken by these organisations. The final part of the chapter discusses some academic literature that focus on the values of governance in respect to E-Gov.

3.2 The evolution of E-governance research trends: from conventional governance to e-democracy

In Elsevier's Government Information Quarterly, Bindu, Sankar and Kumar recently published their very comprehensive findings of a research project on the evolution of research into E-

governance.[61] The article is the result of a comprehensive literature analysis going back as far as 1989. The scope of their research as well as the rigorously researched findings are very important for this thesis. This not only because it provides the necessary bird's eye view on the evolution of E-Gov over a long period, but also because of their future projections. Their extended maturity model, furthermore, plays a significant role in the measurement instrument used in this thesis.

3.2.1 The research project and method of Bindu et al.

The authors sum their research project up as follows:

> "E-governance is a unique, pervasive, and revolutionary term that represents transparent, accountable, efficient, and customer-oriented government administration with the back-end support of ICT. The research domains in the field are enriched by the diversity and rapid evolution of the related fields.
>
> In this study, we systematically investigated the dynamics of the evolution of e-governance, including the evolution, paradigm shifts, diversity of research topics, and emerging research fronts...of e-governance. We visualized the main path of the evolution, which shows four distinct phases.... The analysis also reveals the emerging research fronts and existing research work that can have future impacts based on the network parameters. The study also revealed that the upcoming technology of Web 4.0 is expected to have a crucial role in steering the direction of the future development of e-governance."[62]

The method that Bindu et al. use is Social Network Analysis. The data is derived from the Web of Science.[63] Spanning the period 1989 to 2016 the data was queried for the keywords 'e-government', 'egovernment', 'e-governance', or 'egovernance'. There was no restriction on language, but only research articles (i.e. no reviews or other publications) were included. The outcome of the research is a citation network with 89 638 nodes and 116 790 edges or links. Using various algorithms, they first performed a global main path analysis, and thereafter a

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[61] Bindu s, Sankar CP, Kumar KS. 2019. From conventional governance to e-democracy: Tracing the evolution of e-governance research trends using network analysis tools. *Government Information Quarterly 36.* Elsevier p 385-399

[62] Bindu et al. 2019. From conventional governance to e-democracy... 397

[63] An independent aggregator of citations. https://clarivate.com/webofsciencegroup/solutions/web-of-science/

priority search "for selecting the most significant follower of an article based on the traversal weight of links attached to it.[64] This enabled clustering based on topic identification using natural language processing of the abstracts of the articles referred to. Overall Bindu et al. show "...that the research area is still in the growth and diffusion phase, and has not reached maturity. This indicates the future scope of research and development in e-governance and that it can attain higher growth."[65] This is illustrated in the graph below:

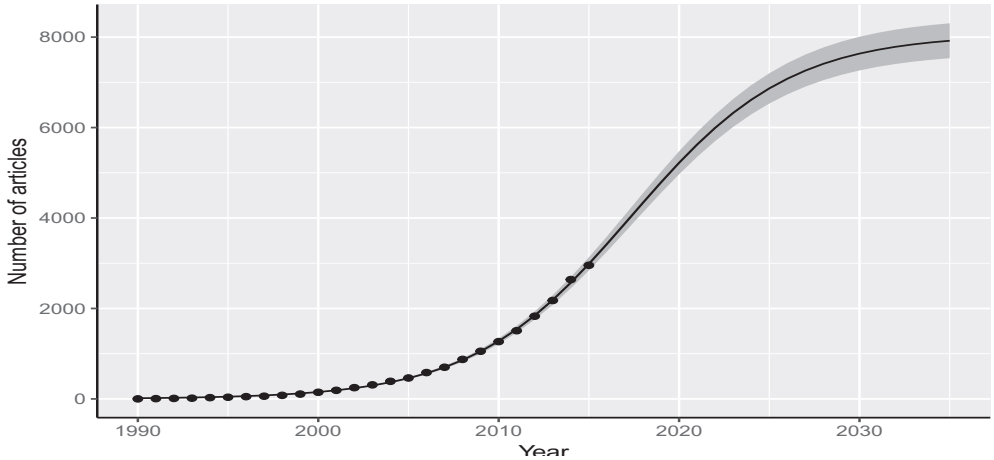

Figure 3.1 – Bindu et al: Growth curve fitted to the yearly published articles[66]

3.2.2 The global main path and cluster - findings

In Figure 2 below a graphic representation is given of the global main path of E-governance literature. The graph is coded in four different colours. These indicate 4 identifiable stages of development, both conceptual and technological.

Bindu et al comment on the graph as follows:

> "The topics revealed by the content analysis of the articles at the end of the main path...shows that e-governance is gaining popularity with the support of tools such as smartphones and Web2.0+ technology. The main path reveals that the major topics of discussion in the articles published at the end of the third phase and at the start of the fourth phase are related to seamless user interactions with government through social

[64] Bindu et al. 2019. From conventional governance to e-democracy... 387

[65] Bindu et al. 2019. From conventional governance to e-democracy... 388

[66] Bindu et al. 2019. From conventional governance to e-democracy... 389

media, participatory governance, e-democracy, and transparency provided by open data.

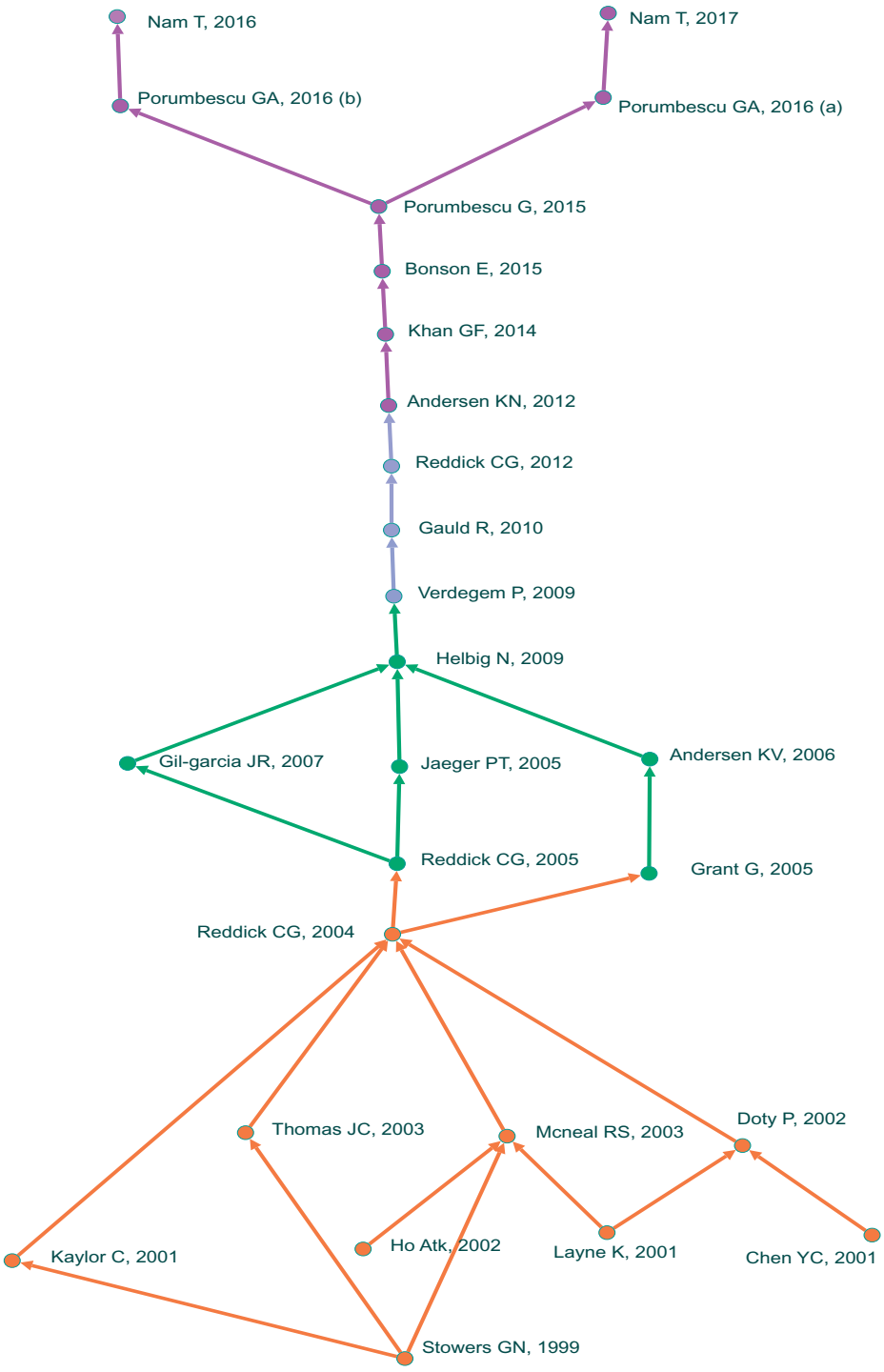

Figure 3.2 – Bindu et al: Global main path of e-governance literature

In the fourth phase starting from 2012, assessments of the user adoption of e-democracy,

social networks, and open data implementation gained prominence."[67]

The four phases in the evolution are distinguished by Bindu et al as follows:

a) Phase 1 – up to 2005. This phase centres on information system frameworks and maturity models. At stake is the transformation of traditional models of governance to e-governance

b) Phase 2 – 2005 to 2009. This characterised by the search for implementation evaluation models, a focus on service quality, user satisfaction, and user adoption models.

c) Phase 3 – 2009 to 2012. The introduction of Web 2 technologies lead to a focus on multi-channel communication, increasing user interaction, and social media – all with a view to supporting e-democracy and participatory governance

d) Phase 4 – 2012 to date. This phase extends and deepens the process that began with the introduction of Web 2. To the notions of e-democracy, e-participation, and open data, an emphasis on transparency, accountability and citizen participation are added. So too is the quest for technological improvements to support and sustain e-governance.[68]

On this basis Bindu et al compiled an "E-governance road map" showing the historical development as well as indicating the most likely topics in the near future.

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[67] Bindu et al. 2019. From conventional governance to e-democracy... 390

[68] Bindu et al. 2019. From conventional governance to e-democracy... 391 / 395 / 396

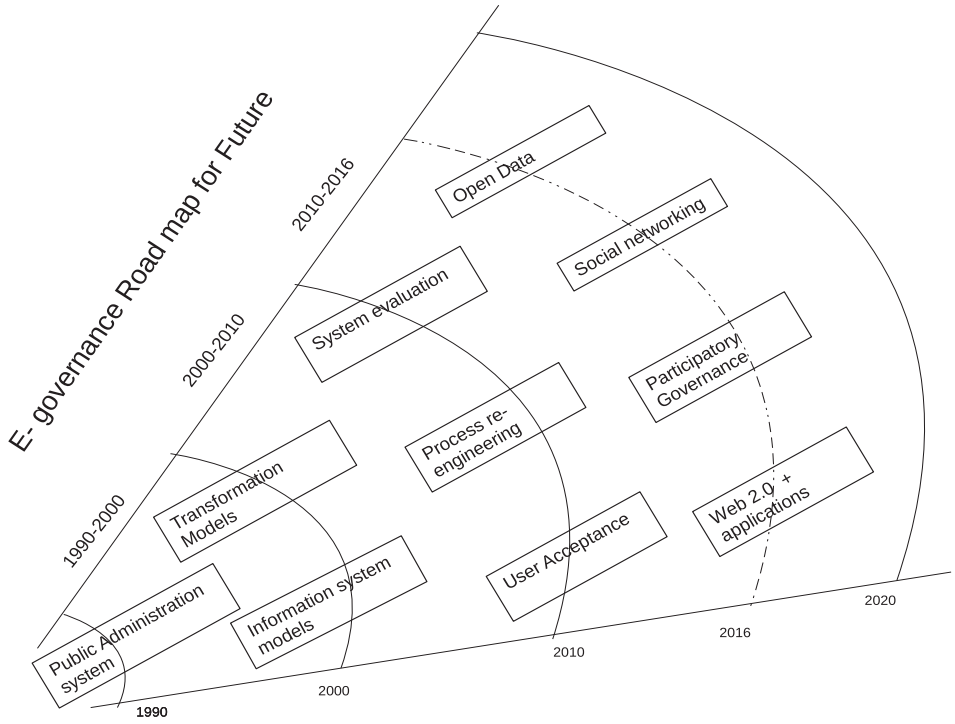

Figure 3.3 – Bindu et al: Road map of e-governance research activities

Bindu et al consider the above results further corroborated by their cluster analysis.

Figure 3.4 – Bindu et al: The clusters

Four main clusters, and a number of sub-clusters, were identified. Of the four, cluster 1 (in red) comprises 41% (or 25 188 nodes) of the giant component of the clustering. Because of its size

a sub-clustering was done which revealed the below table of topics.

Topics related to the sub-clusters of cluster #1.

Sub-cluster	Size %	Key words
#1	18.58	Evaluation Models on trust worthiness, user adoption
#2	15.09	Customer satisfaction Models
#3	12.59	Open government
#4	7.05	Open government, e-participation
#5	5.64	Maturity Models, Research reviews
#6	5.16	Transformation to open government
#7	4.40	Policy, strategic decisions, framework creation

Table 3.1: Bindu et al: sub-clusters[69]

Cluster 2 (in green) contains 31% of the articles. These comprise mostly quality surveys on user adoption and evaluation of customer satisfaction.

Cluster 3 (in blue) contains 2018 nodes (14%) and centres on technology adoption and process-re-engineering. It is mainly about accessibility and the credibility of services based on new technologies.

Cluster 4 (in pink) is smaller, containing 3% of the total articles. It revolves around e-commerce and e-procurement related to government organizations.

3.2.3 The technology aligned extended maturity model

Perhaps the most important contribution by Bindu et al is the overlapping of the evolution of technological systems with the evolution of E-Gov. After all, what any E-Gov configuration may or may not achieve, is directly linked to the technology platform on which it is based. However, research linking content to assumed technology is mostly not part of the research discussed in literature.

In this thesis, however, technological capacity is assumed to be a vital component of any measurement instrument of E-Gov. To this end the extended maturity model offered by Bindu et al is an important reference for the development of the measurement instrument used in this thesis. It is, therefore, useful to quote extensively from the article on this aspect:

> "[The} topics extracted from the content analysis of the articles in the main path...closely relates to the advancement of Web technology. Hence, we propose a conceptual model of the maturity of e-governance implementation based on the development of Web technology....

[69] Bindu et al. 2019. From conventional governance to e-democracy... 393

The first phase of e-governance during 1989 to 2005...is marked by the adoption of digital technologies for public administration. The introduction and wide application of electronic gadgets, including computers, fax machines, printers, scanners, and so on at the grass-roots level of government administration promoted the implementation of e-governance. Web 1.0 technology, which includes the *web of documents* during 1989 to 2005 helped the transfer of documents to the internet. This period is the first phase of the evolution of e-governance that give *information* prominence....

The second phase of evolution of e-governance starting from 2004, which involves two-way interactions between the government and citizens, and interactions within society, was fostered by Web 2.0, known as the *Web of people*, which was capable of connecting billions of people. Web 2.0 technology was the basis of crowds forming on social networks including YouTube, Flicker, Blogs, LinkedIn, Facebook, my-Space, and so on. In the second phase, governments utilised Web 2.0 as a media for communicating effectively with a large group of citizens and to obtain their feedback. The introduction of digital online financial transactions and plastic money also played an essential role in this phase. We can represent the characteristics of this phase as...*Interaction*....

The third phase...from 2009 to 2012, which was also promoted by Web 3.0 technology, is known as the *Web of data*. It could group even more people, leading to the possibility of semantic web identification of major topics of discussion, social opinion gathering and analysis of data using artificial intelligence. This stage initiated the transformation of the e-government to participatory government, with citizen involvement in decision making. So, the core feature of this stage is *Transformation*. Web 3.0 also contributes to the fourth phase of e-governance, in which e-participation, e-democracy, and open data are the trends....

The upcoming technology Web 4.0, the extension of Web 3.0, could push e-governance to an even higher level. Web 4.0 technology is known as the web of *symbiosis*, or the *intelligent interactive electronic agent*. The computing techniques of artificial intelligence, machine learning, and personal identification using cameras and other connected devices tagged with radio-frequency identification (RFID) chips can enhance communication through web channels and provide a more personalised response. The adoption of Web 4.0 technologies utilising more flexible data types into e-government services may be the focus of research in the next phase. Web 4.0 technology offers prospects for the next stage of e-governance characterised by intelligent interaction with

users, resulting in the stage of symbiosis. With the support of Web 4.0 technology, the e-governance system will be able to interact with users with the features of an intelligent human being who can identify persons by capturing biometric information. The e-governance system will also be able to understand the user requirements by using artificial intelligence and machine learning techniques to analyse the historical records of the user activities in the system....

In short, the e-governance maturity model can be conceptualized with five stages of maturity. The first four stages agree with the Gartner group maturity model proposed by Baum and Di Maio (2000). The fifth stage of symbiosis is expected to evolve with the support of Web 4.0 technology, machine learning, cloud computing, and RFID tagged devices"[70]

The graphic representation of the above is presented below:

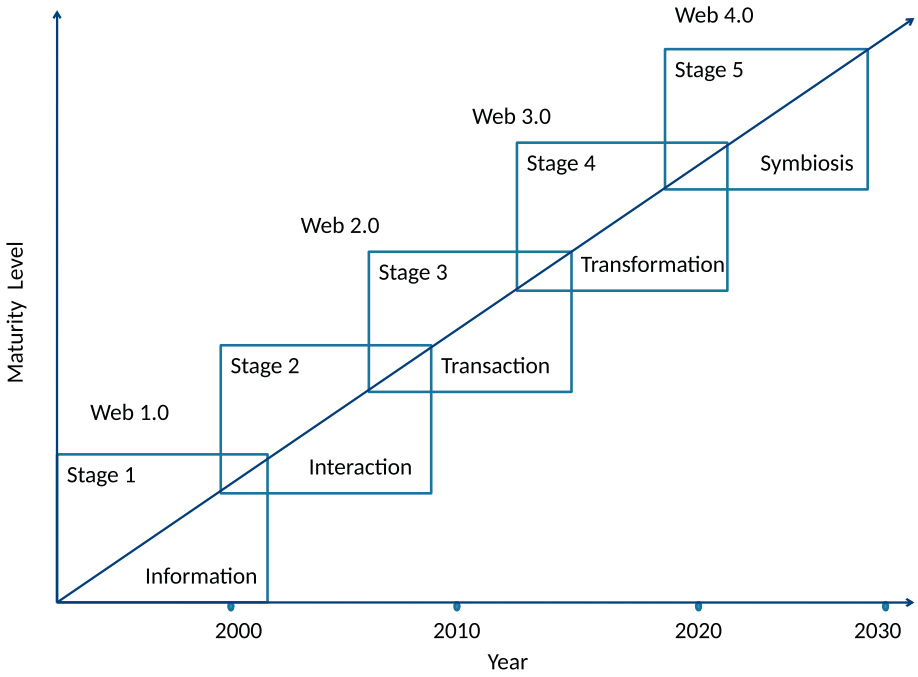

Figure 3.5 – Bindu et al: Maturity development model and extension

3.3 The advent of open data policy

One of the notable features of the study reported on in the previous section is the link between E-Gov and electronic democracy (E-democracy). As early as 2009 the connection between governments' web presences and democracy was made in the Encyclopedia of Information

[70] Bindu, Sankar, Kumar. 2019. From conventional governance to e-democracy... 394

Science and Technology, Ari-Veikko Anttiroiko stated:

> "The changing role of the state and a managerialist view of the operations of public sector organizations gave rise to the idea of new public governance. Gradually more citizen centred views of governance also emerged, reflecting a need to strengthen the role of citizens and communities in governance processes at different institutional levels. This development, especially since the mid-1990's, has been affected by new technologies, leading to a kind of coevolution of institutional arrangements and technological solutions that have paved the way for a better understanding of the potentials of democratic e-governance."[71]

This theme is further explored in this section with a resume of strategy positions and programmes of the major multilateral organisations, the OECD, the EU and the UN.

3.3.1 The OECD and Open, Useful and Re-Usable (OUR) data

The OECD is an influential policy analysis and strategy formulation organisation. It takes a strong policy advisory stance on E-Government, with the emphasis on utilising E-Gov to deepen democracy. This has culminated in two policy documents in recent years. They can be seen as the official policy that the OECD advises its members to follow. The OECD stance is popularised as OURdata. It will be discussed her at the hand of three [72]/ [73]/ [74] recent publications and the suggested "self-help" toolkit[75].

The OECD sides, broadly speaking, with the open data movement with its roots dating back to

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[71] Anttiroiko A-V, 2009. Democratic E-Governance, in Encyclopedia of Information Science and Technology, 2n Ed. IGI Global

[72] Van Ooijen C, Ubaldi B, Welby B. 2019. The path to becoming a data-driven Public Sector. *OECD Digital government studies.* Available: https://www.oecd.org/gov/digital-government/working-paper-a-data-driven-public-sector.htm

[73] Perez JAR, Emilsson C. 2020. Open Useful and Re-usable data (OURdata) Index 2019. *OECD Public governance policy papers 01*. Available: https://www.oecd.org/gov/digital-government/ourdata-index-policy-paper-2020.pdf

[74] Welby B. 2019. The impact of digital government on citizen wellbeing. *OECD Working Papers on Public Governance.* Available: https://www.oecd-ilibrary.org/docserver/24bac82f-en.pdf?expires=1595755375&id=id&accname=guest&checksum=FEDE64571D3E24862B6D48853C60F5F7

[75] OECD Digital Government Toolkit. Available: http://www.oecd.org/governance/digital-government/toolkit/home/

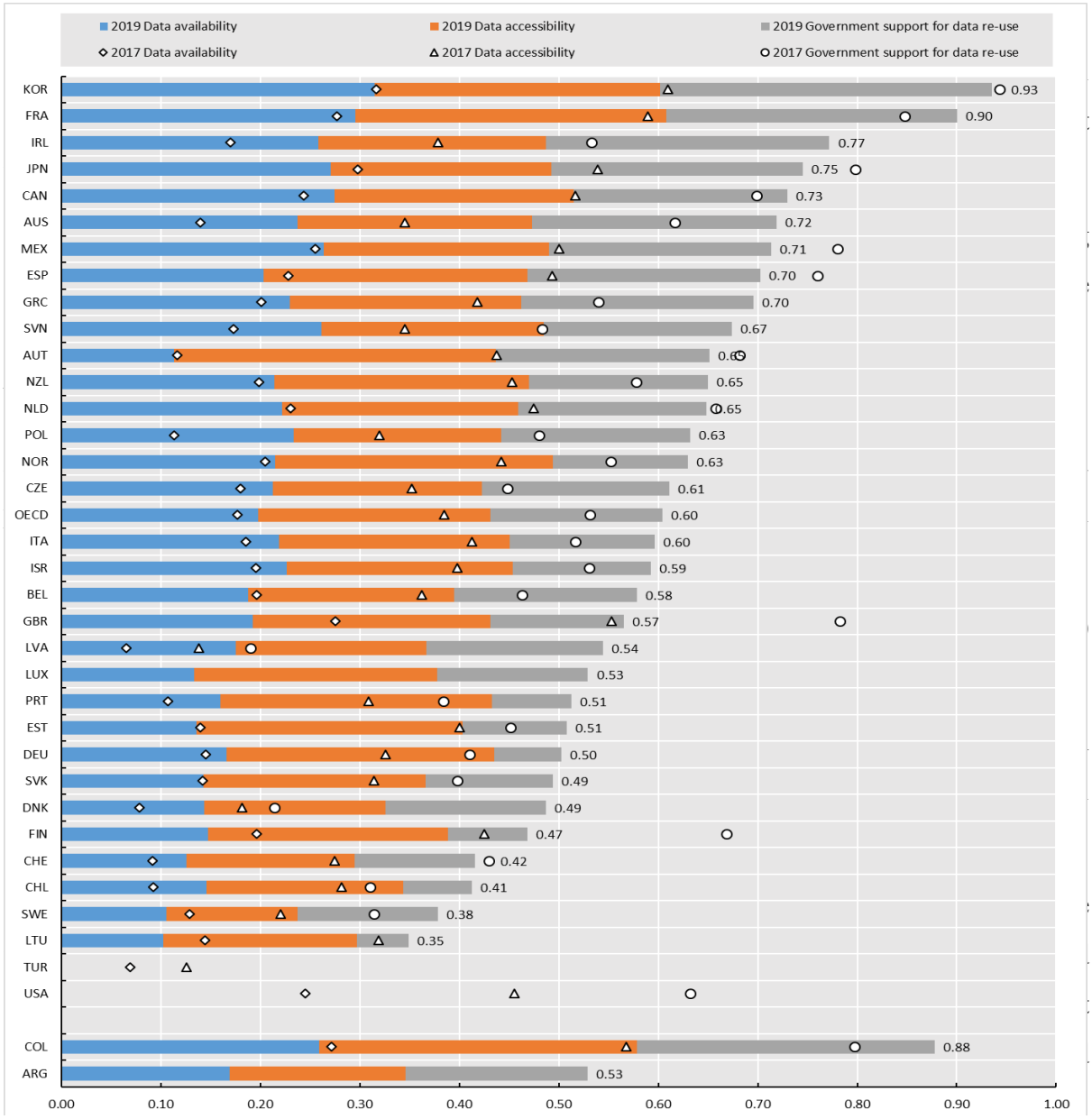

Figure 3.6 - OECD Open, Useful and Re-usable data (OURdata Index): Results for 2019 and 2017

To come to this position a fundamental conceptual as well as organisational shift is necessary.

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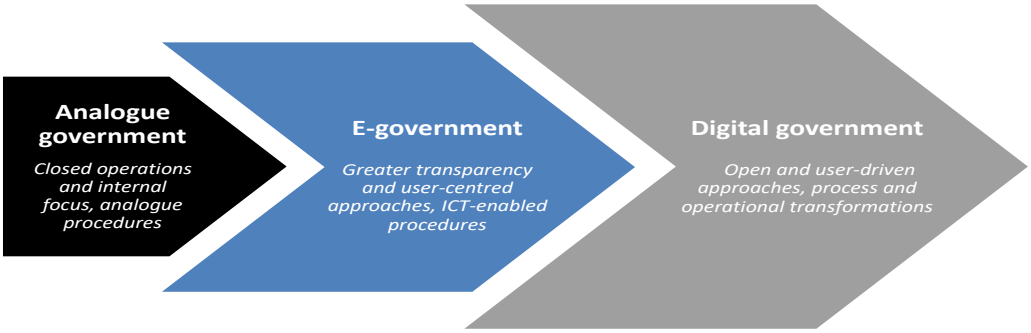
[76] Perez JAR, Emilsson C. 2020. Open Useful and Re-usable data (OURdata) Index 2019…4

[77] See: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0406

[78] Perez JAR, Emilsson C. 2020. Open Useful and Re-usable data (OURdata) Index 2019…26

The OECD formulates this as a shift from 'E-Government' to 'Digital Government' and expresses this in figure 3.7[79] below:



Source: Based on OECD (2014[11]) Recommendation of the Council on Digital Government Strategies OECD, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0406.

Figure 3.7 - OECD: From analogue to digital government

The difference between E-government and Digital-government in this conception is that in the E-government phase government essentially operates the same way as before, but enhances its services through electronic means. E-Government is thus equated with service quality. In the Digital mode government itself becomes data-driven and uses this to extend democracy into every-day life. In this conception, Digital government is a proxy for governance.

The OECD formulates it as follows:

Digital government will "…be more open, innovative and agile…. A truly data-driven public sector:

- recognises data as a key strategic asset, defines its value and measures its impact
- reflects active efforts to remove barriers to managing, sharing and reusing data
- applies data to transform the design, delivery and monitoring of public policies and services
- values efforts to publish data openly and the use of data between and within public sector organisations
- understands the data rights of citizens in terms of ethical behaviours,

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79 Van Ooijen C, Ubaldi B, Welby B. 2019. The path to becoming a data-driven Public Sector …14

transparency of usage, protection of privacy and security of data."[80]

On this basis a government data value cycle can be imagined. In graphic form it looks like this:

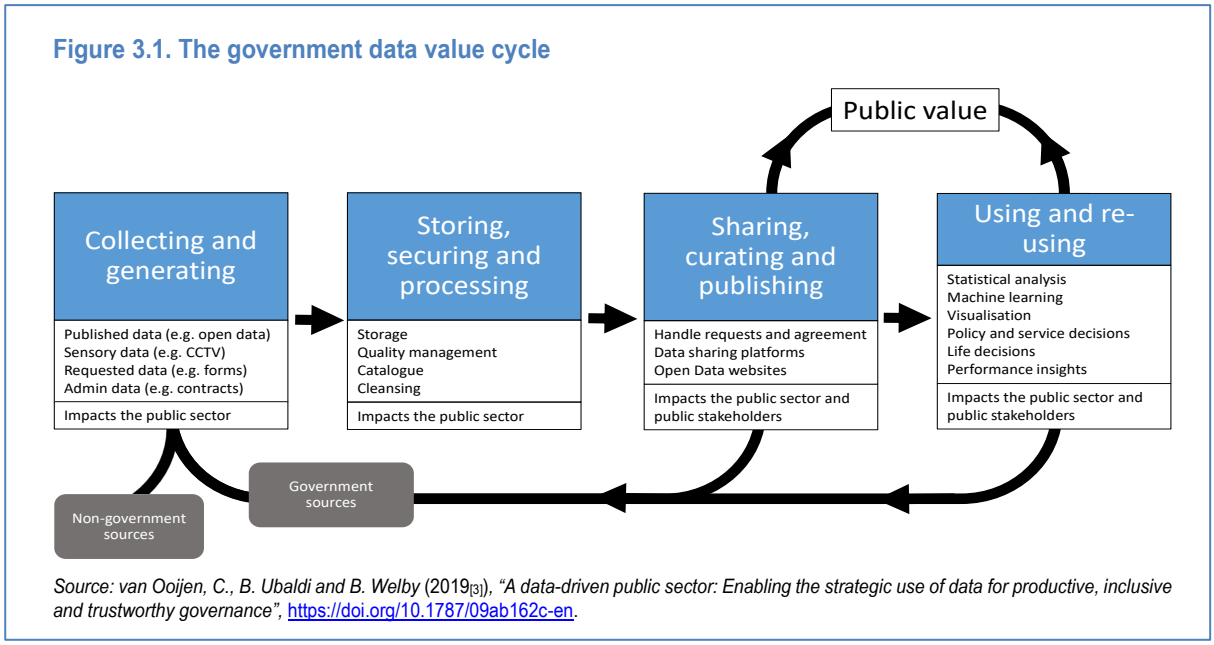

Figure 3.8 - OECD: The government data value cycle[81]

The most interesting part of the graphic is the circular flow of data on the right-hand side. It expresses the premise on which the model is built, i.e. open data *by default*. Government is a source of data, but also a consumer. At the same time citizens are also producers of data as well as consumers. This position is formulated as follows:

> "A government is open by default when it unties technology and drive innovation, within the limits of available legislation and in balance with national and public interest. An open by default approach describes the extent to which an agile and proactive government uses and shares digital technologies and tools to communicate, engage, collaborate with and build bridges between all actors in order to collect insights towards a more knowledge-based public sector. This comprises not only providing drivers to promote collaborations and innovation (e.g. open government data, open source) respecting citizens' digital rights (e.g. data protection, security, confidentiality and privacy protection legislation), but also opening up and *co-designing government processes* (e.g. policy life cycle, public service delivery and ICT commissioning). The

[80] Van Ooijen C, Ubaldi B, Welby B. 2019. The path to becoming a data-driven Public Sector… 17

[81] Van Ooijen C, Ubaldi B, Welby B. 2019. The path to becoming a data-driven Public Sector… 61

> desire of governments to collaborate across organizational boundaries and involve those outside of government is critical in ensuring that service teams understand and engage with the needs of users and that government itself is able to collaborate and coordinate its activity to solve whole problems."[82]

Or as it was stated in the *Recommendation* of 2014, a data-driven culture consists of:

> "...developing frameworks to enable, guide and foster access to, use and reuse of the increasing amount of evidence, statistics and data concerning operations, processes and results to (a) increase openness and transparency; and (b) incentivise public engagement in policy making, public value creation, service design and delivery; balancing the need to provide timely official data with the need to deliver trustworthy data, managing risks of data misuse related to the increased availability of data in open formats (i.e. allowing use and reuse, and the possibility for non-governmental actors to reuse and supplement data with a view to maximising public economic and social value)."[83]

3.3.2 (OUR)Data implementation principles

It is clear that a comprehensive introduction of a data-driven public service touches on all aspects of the service and its political background. The twelve implementation principles, therefore, cover a wide variety of aspects, most of which are not directly relevant to assessments of a government's web presence. But some principles do cover the public use of the WWW. It is these principles that are important for a measurement instrument. They are briefly profiled below.

Principle One – Openness, transparency and inclusiveness

Anticipated benefits are:

- Good governance
- Better services and policies
- More agile, effective and convenient public engagement
- Greater trust in government
- Social well-being and inclusive policy outcomes
- Economic growth

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[82] Perez JAR, Emilsson C. 2020. Open Useful and Re-usable data (OURdata) Index 2019…14

[83] Van Ooijen C, Ubaldi B, Welby B. 2019. The path to becoming a data-driven Public Sector… 131

Principle Two - Engagement and participation in policy making and service delivery

- Create inclusive governance models
- Better understand citizens' evolving needs
- Leverage information, ideas and resources held outside the public sector
- Lower costs and administrative burdens
- Improve policy outcomes
- Foster user-driven service design and deliver

Principle Three – Creation of a data-driven culture in the public sector

- Better exploit digital technologies and data analysis to understand societal needs;
- Embed the use of data throughout the policy cycle
- Put in place governance arrangements to ensure responsible and coherent use of data that benefits citizens and strengthens public trust
- Develop a culture of data analysis and use within the public sector that helps predicting new needs and trends, and understanding how to improve existing processes and dynamics.

3.3.3 Initiatives by the UN and EU

The UN takes the same position as the OECD. Following on the UN General Assembly resolution 66/288, the *UN E-government Knowledgebase*[84] finds "the power of communication technologies, including connection technologies and innovative applications, ... promote knowledge exchange, technical cooperation and capacity-building for sustainable development." In this context sustainable development is seen as democracy, good governance and the rule of law.[85]

To this end the UN has developed the Electronic Government Development Index (EGDI)

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[84] UN E-Government Knowledge Base. 2020. Overview https://publicadministration.un.org/egovkb/en-us/Overview

[85] "Traditionally, e-government has been considered as the use of ICTs for improving the efficiency of government agencies and providing government services online. Later, the framework of e-government has broadened to include use of ICT by government for conducting a wide range of interactions with citizens and businesses as well as open government data and use of ICTs to enable innovation in governance.... Through innovation and e-government, governments around the world can be more efficient, provide better services, respond to the demands of citizens for transparency and accountability, be more inclusive and thus restore the trust of citizens in their governments." https://publicadministration.un.org/egovkb/en-us/About/UNeGovDD-Framework

measuring provision of online services, telecommunications connectivity, and human capacity,[86] and the Electronic Participation Index (EPI) which measures *E-Information* (being access with or without demand), *E-consultation* with the aim to engage "citizens in contributions to and deliberation on public policies and services", and *E-decision-making* to empower "citizens through co-design of policy option and co-production of service components and delivery modalities."[87] EGDI and EPI measurement applies only to the official national portal.[88]

The most recent annual EGDI report (for 2020) has been published.[89] Like the OECD, the notion of digital government is used to express a comprehensive drive toward e-democracy. It is noticeable that no African country makes it into the high EGDI category. Europe, followed by Asia takes the lead in this category.

However, it is not only the UN and OECD who link E-Gov with democracy. In December 2004 the Council of Europe published Rec (2004) 15 and an explanatory memorandum on E-governance.[90] The document states among others that "the development and implementation of e-governance initiatives should serve to further strengthen human rights, particularly the right of everyone to express, seek, receive and impart information and ideas". It notes "that e-governance is about democratic governance and not about purely technical issues, and ... that the full potential of e-governance will be harnessed only if ICTs are introduced alongside changes in the structures, processes and ways that the work of public authorities is

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[86] UN E-Government Knowledge Base. 2020. https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index

[87] UN E-Government Knowledge Base. 2020. https://publicadministration.un.org/egovkb/en-us/About/Overview/E-Participation-Index

[88] On this measurement South Africa does not come out of it particularly well. It was ranked for EGDI as 78th (2020), 68th (2018), 76th (2016) and 97th (2014). Fore EPI the rankings are: 57th (2020), 39th (2018), 76th (2016) and 97th (2014)

[89] United Nations. 2020. *Survey 2020. Digital Government in the Decade of Action for Sustainable Development.* https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf

[90] Committee of Ministers of the Council of Europe. 2005. *Electronic Governance (E-Governance).* Council of Europe Publishers: Strassbourg

organised."[91]

The Council continues to recommend an e-governance strategy[92] which among others:

"– enhances the effectiveness of democratic processes;

– widens the choices available to users for communicating and transacting with government by providing additional channels;

– is based on an inclusive and non-discriminatory approach;

– involves users in strategic choices and respects their needs and priorities;

– ensures transparency and sustainability;

– provides a framework for partnership between the public authorities, the private sector and other organisations of civil society;

– maintains and enhances citizens' confidence in democratic processes, public authorities and public services, including through protecting personal data;

– ensures system availability, security, integrity and interoperability;

– provides for an ICT policy based on technology neutrality, open standards and on the assessment of possibilities offered by different software models, including open source models"

3.5 Conclusions

Despite the obvious overlapping and at times contradictory use of terminology, and the clear lack of standardised concepts we have seen in chapters 2 and 3, an overall consensus as to the purpose of E-Gov is evident in the literature discussed. At least in those parts of the world where pronouncements by the UN, OECD and the EU are taken seriously there is a shared objective to utilise digital media, or in the case of this thesis the WWW, to enhance democracy.

In as much as democracy is a matter of interaction between government and citizens, and in as much as that interaction is mediated by the WWW, the literature above point to three clearly recognisable components of a comprehensive E-Gov model:

a) information flow (in particular open data)

b) services delivery (effective service quality)

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[91] Committee of Ministers of the Council of Europe. 2005. *Electronic Governance.* p 5/6

[92] Committee of Ministers of the Council of Europe. 2005. *Electronic Governance.* p 7

c) citizen participation (e-democracy)

A factor that was noted by Kumar and Bindu, which will be taken up in the process of designing the instrument of analysis for this thesis, is the relative absence in literature of a framework to assess websites in terms of their use of internet technology. This is, in fact, a serious shortcoming and is the result of the heavy reliance on customer satisfaction as a primary criterion which is prevalent in business orientated website evaluations. Ignoring the factor of available technology means that E-Gov analysis ignores the question: what more and better can government do? In effect, it takes citizen engagement out of the equation, as the technologies available in 2020 all support interactive relationship between government and citizens possible.

With the above in mind, the next chapter welds all the diverse inputs into a measurement tool.

Chapter Four

The DEWEM and an E-governance measurement instrument

4.1 Introduction

In this chapter the third of the platform articles on which this thesis draws, is discussed. Once again it is the product of an elaborate and wide-ranging literature analysis. This time the objective was to derive at a credible framework for an evaluation of the governance quality of a governmental website. The outcome of the analysis is called the DEWEM.

DEWEM will form the foundation of the actual evaluations of some South African government websites in chapter 5. However, a trail run of the application of DEWEM revealed a shortcoming. It fails to include a category to classify the web technology evidenced in the actual website. This omission makes it difficult to plot the website on the evolutionary graph that was discussed in the previous chapter.

This chapter starts with an exposition of the analysis on which DEWEM is based. The second section focuses specifically on the stages of web technology, in preparation for an adjustment to the DEWEM. The chapter concludes with a brief overview of the advanced technologies that a mature E-Gov should incorporate in 2020.

4.2 The Democratic E-governance Website Model (DEWEM)

In the Government Information Quarterly of April 2019, published by Elsevier, the first comprehensive attempt to develop model to evaluate websites for their e-governance quality

was published.[93] This thesis uses the DEWEM as the platform for its measurement instrument. Due to the importance of DEWM for this thesis an extensive summary of the article is presented here.

Lee-Geiller and Lee argue that "...early e-government practices tended to overlook democratic purposes by focusing on the features of e-business and information systems. [And hence] that e-government system design has focused mainly on the provider's perspectives." This contributes to "...diverging gaps between citizens' expectations and the government's capacity [resulting] in citizen discontent with government." One symptom of this is the increasing voter apathy in many countries.[94]

In as much as E-Gov can be blamed for this, the authors draw on a number of publications to point out that "...e-government initiatives have hitherto tended to be extensions of the existing governance paradigm of managerialism, and their implementation has focused mainly on the providers' perspectives. Consequently, despite its recognized advantages, the impact of e-government initiatives has been limited." Limited improvements in effectiveness and efficiency may be observed, but this does not include democratic advances and legitimacy.[95]

With reference to Anttiroiko,[96] Lee-Geiller and Lee posit that "democratic e-governance combines three conceptual elements: information and communication technologies (ICTs) as tools, governance as a process, and democracy as an underlying principle". In fact, they consider E-Gov to be an offshoot of democratic principles. Hence, "...the use of technology can contribute to resolving the political and social issues in modern governance, and in particular [through] the government website as a key instrument. As a government website carries out heterogeneous functions, including information publication, public service delivery, and public participation, it is important that its design enables it to promote democratic principles and processes.[97] In short, the point of E-Gov is democratic governance.

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93 Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance: A conceptual model for evaluation, in *Government Information Quarterly 36.* Elsevier. 208 – 225. https://www.sciencedirect.com/science/article/abs/pii/S0740624X18302752

94 Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 208

95 Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 209

96 Already refered to in chapter 3.3

97 Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 211/209

This is in itself not a new position or objective. Numerous publications already point in that direction and have made useful contributions. But, "*...an integrated model that encompasses multidimensional aspects of a government website is not yet available*". [Thesis italics] This is the gap that Lee-Geiller and Lee attempt to fill "...by conducting a qualitative meta-analysis of the literature from various disciplines, based on a conceptual framework of democratic e-governance [in order to develop] the democratic e-governance website evaluation model (DEWEM). This model is not the outcome of a series of quantitative tests, but a conceptual framework that provides insights for further theory building and for website policy design."[98]

In order to arrive at the model, the authors constructed a rigorous descriptive-interpretive method. The literature base consists of primary studies in the fields of Information Systems, Business, E-government, Democratic Theory and Public Administration. To identify the primary publications in these fields a literature search of articles in leading journals and policy handbooks of international organisations were supplemented by keyword searches through the Rutgers University library of the databases of Elsevier, SAGE, JSTOR and Wiley Online. The purpose was:

> "to collect knowledge of the topic over the length and breadth of the relevant studies, as well as policy guidelines, to encompass both its scholarly and its practical aspects. The keywords included *website design, website evaluation, website assessment, website quality, service quality, e-service, public e-service, egovernment, e-government website, government website, e-governance, open government, government portal, participatory platform, e-participation, democratic theory, deliberative democracy, and participatory democracy*. Consequently, the literature on the synthesis of evaluation criteria included studies from various disciplines, such as information systems, business, and public administration, and the literature on building a theoretical framework came from political science and public administration."[99]

As far as technical and service quality aspects go, Lee-Geiller and Lee identify the same themes that were already identified and discussed in chapters 2 and 3. What is new, however, is an extensive coverage of governance as the process of the actualisation of democratic principles. Going back as far as 1762 and Jean-Jacques Rousseau's Social Contract, they establish the

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[98] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 209

[99] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 209

following democratic principles to form the bedrock of democratic e-governance: transparency, accountability and collaboration. Drawing on Anttiroiko's earlier work, they present their understanding of democratic e-governance diagrammatically as follows:

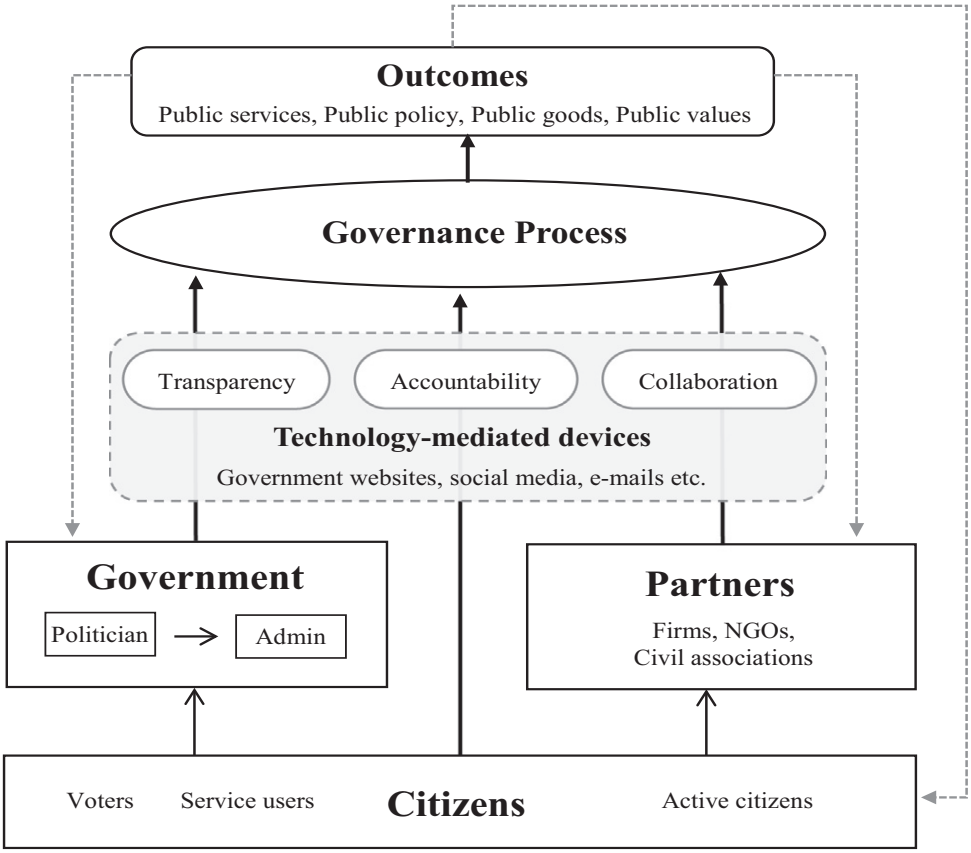

Figure 4.1 – Lee-Geiller and Lee: Schematic diagram of democratic e-governance[100]

Through a comprehensive process of aggregating, filtering and evaluating the technical as well as the conceptual dimensions of the primary publications obtained from the various disciplines and international organisations, a meta-structure is constructed. This is the *Democratic Website Evaluation Model.*

The DEWEM comprises 3 different but complementary strands, each subdivided into sub-factors. Altogether it fuses the key dimensions of the technical and service perspectives on websites with the conceptual principles of core democratic values. DEWEM, therefore,

a) "...shows a holistic picture of the criteria for the design and evaluation of government websites. Prior studies of government websites suggested detailed criteria, focusing

[100] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 212

on certain aspects of e-governance such as website quality and e-service" and

b) "...brings a stimulating view of citizens as active agents in governance, and expands the purview of government website analysis from citizens' adoption to their engagement. Prior studies have taken a passive view of citizens. Specifically, E-GovQual treats citizens as customers of public services, and the e-government acceptance model sees them as end-users of websites. However, taking democratic e-governance as a premise, DEWEM outlines the ways in which citizens can engage in decision-making processes, which also enhances civic skills."[101]

The overall framework of DEWEM is presented in the diagram below:

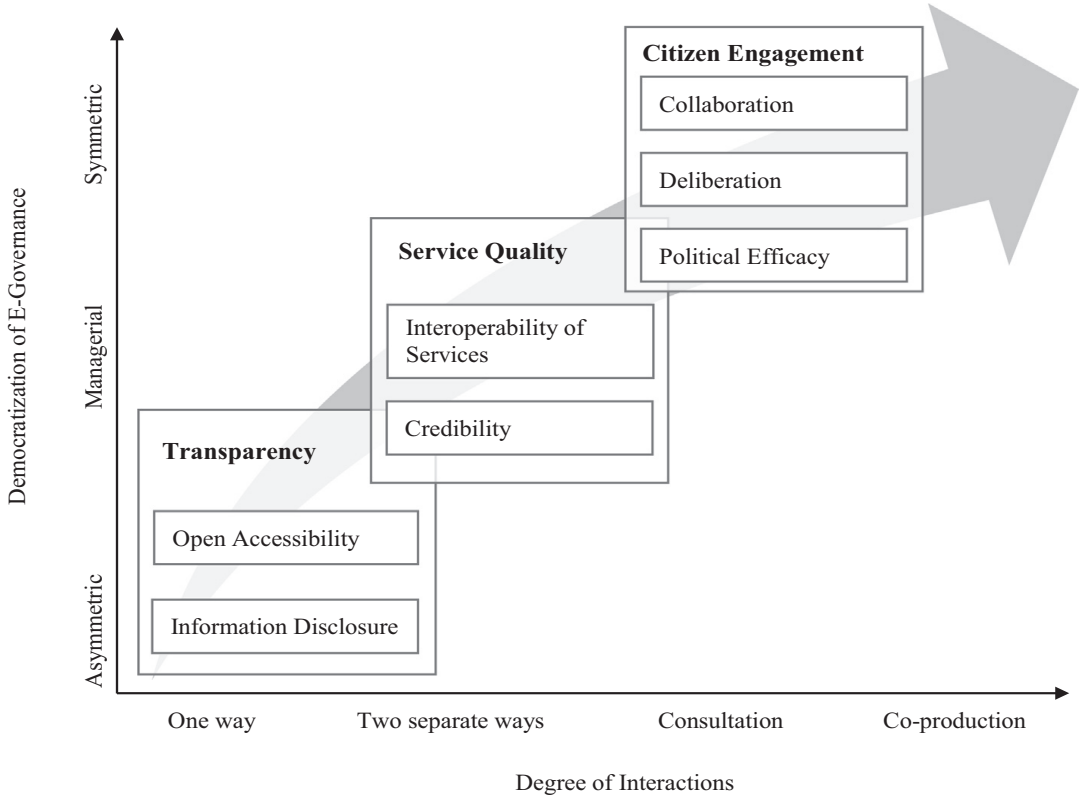

Figure 4.2 – Lee-Geiller and Lee: The structural components of DEWEM[102]

The expanded version of the DEWEM, including indicators for the various sub-factors is presented in the next pages.[103]

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[101] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 220

[102] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 221

[103] Lee-Geiller S and Lee T, 2019. Using government websites to enhance democratic E-governance... 218/ 219

Measurements of transparency.

Variable	Definition
Open accessibility	
Non-discriminatory	Website is available to anyone with no requirement of registration
Open license	Information provided is not subject to copyright, privacy or security restrictions, and open licensed
Free of charge	Information and services provided are available free of charge
Non-proprietary	Information and services provided are in a format over which no entity has exclusive control
System availability	Website is usable whenever needed
Alternative channels	Alternative communication channels and means other than online channels are shown
SNS/smartphone application	Website works in connection with other channels such as social media and smartphone application
Information disclosure	
Types of Information	
Public service standards	Disclosure of officially approved public service standards
Policy agendas	Disclosure of meeting agendas and decisions made by the government
Live broadcasting of meetings	Website provides links to watch live broadcasting of meetings
Strategic plans	Disclosure of periodical activity reports on policy and strategy
Performance reports	Disclosure of periodical performance reports
Ethical commission	Publication of reports or activities of ethical boards
Quality of Information	
Usefulness	Website offers useful information that helps citizens carry out tasks satisfactorily
Timeliness	Publication of information is done in a timely manner
Level of detail	Information provided is appropriately detailed
Source indications	Indication of validity of information sources and links

Table 4.1 – DEWEM measurement criteria for Transparency

Measurements of service quality.

Variable	Definition
Interoperability of services	
Coordination at national level	Website is aligned, and linked throughout all levels of governments
Accuracy	Website provides on-time and accurate services, functioning free from failure upon the first request
Navigational structure	Website's structure is clear and easy to follow
Content organization	Information and services are organized by categories
Visual elements	Website looks clean and professional, using consistent layout, color, and appealing multimedia features, regardless of technical variances such as resolution, browsers and different language
Design	Website is designed aesthetically
Website performance at low resolutions	Website performs appropriately regardless of different resolution levels
Appearances on different browsers	Website appears consistently on different web browsers
Different language choices	Different language options are available
In-site search	Search functions within the website are available
Processing capacity	Website provides quick transactions
Page loading time	Pages load quickly
Task processing time	Tasks, such as file submission, upload, and downloading, are processed quickly
Credibility	
Error management	Website is free from failure; in case of any, communication and management of errors are proactive
Website guidelines for citizens to use	Guidelines or tutorials for website use are available
Terms of use statement	Publication of specific service policies in place
Privacy	Personal data provided for authentication is used only for the reason submitted
Safety	Acquisition of personal data is secure and archived securely

Table 4.2 - DEWEM measurement criteria for Service Quality

Measurements of Citizen Engagement.

Variable	Definition
Political efficacy	
Responsiveness to inquiry/complaints	Website has inquiry/complaint page in which prompt replies and processing status are shown to support citizens to complete their tasks
Direct communication with elected government officials	Website provides a direct communication channel with policymakers
Encouragement/promotion of participation	Programs or activities are carried out to encourage citizen participation
Sharing the products and outcomes created through collaboration	Website presents the outcomes created through the public deliberation and collaboration
Deliberation	
Questionnaires	Website carries out questionnaires on a variety of public issues to improve the public services
Features of collecting, sharing ideas and local knowledge	Website employs tools designed for collecting citizen proposals and local knowledge
Tools for making comments and discussion	Website facilitates the dialog with tools for making comments online
Collaboration	
Voting and ranking ideas or solutions	Website contains tools to sort ideas and solutions through online voting and ranking tools
Tools for collaboration	Website provides ICT-mediated tools to allow effective collaboration between the citizens and the government for decision-making
Participatory performance assessment	Website provides tools for citizens to partake in government's performance assessment

Table 4.3 - DEWEM measurement criteria for Citizen Engagement

4.3 Stages of web technology

In the work of Bindu et al in chapter 3 and Lee-Geiller and Lee in this chapter a five, respectively 4 stage web technological development schema were offered. This is not the conventional schema, which is normally a 3-scale model.

There does not seem to be much discussion on this matter and the choice for a scale seems to be more one of preference. What is not to be disputed is that over the past 25 years major changes took place in the technological backroom of the internet, each opening decisively new ways of utilising the web.

In this thesis the point is made that any analysis of a website must take the possible technologies

that pertain at that moment into account when subjecting the website to evaluation. Given the importance of a government's website – particularly given the remarks by Lee-Geiller and Lee about the importance of bridging the growing gap between governments and citizens – it can be argued that government should, more than anyone else, be keen to utilise technological advances to their fullest.

However, it does not seem to be useful to engage in a debate on whether there are 3, 4, 5 or more stages of web technological evolution. This thesis chooses to follow the more conventional 3- stage model. By attaching that to the DEWEM proves to yield quite useful results. In this section a brief overview of the 3-stage model will be given, followed by a brief profile of the technologies that at present are deemed as cutting-edge and which the evaluation presented in the next chapter particularly attempted to find demonstrated in the selected websites.

4.3.1 The 3-stage schema of the evolution of web technology

It is important to remember that "the world wide web is not identical to the internet, but it is the most prominent part of it."[104] Since Sir Tim Berners Lee [105] wrote the protocol that made the internet the platform for a WWW 3 stages of web use of the internet is commonly identified.

a) Web 1.0 – one directionality

Web 1.0 was "developed in 1991 and is the first generation of read-only web. It was known as the informational mono-directional web."[106] It only allowed commercial business, and later governments, to share information with customers. Web 1.0 "is a common information space to enable the communication between people by sharing information."[107] This was one way of communication, where people used it to search and read information from the web.

The main feature of Web 1.0 is the publishing of static information.[108] This means that the content published on the web only changes when the producer or person who has uploaded it

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[104] Aziz and Madani. 2017. Evolution of the Web and its uses in healthcare. 245

[105] Neil. 2017. Weaving the web. Available: DOI: https://doi-org.ez.sun.ac.za/10.1145/3077334

[106] Aziz and Madani. 2017. Evolution of the Web and its uses in healthcare. 246

[107] Aziz and Madani. 2017. Evolution of the…. 246

[108] Rudman and Bruwer. 2016. Defining Web 3.0: opportunities and challenges. 135

decides to do so. As Kreps and Kimppa point out:

> "Web 1.0 ... represents the broadcast model web of static HTML pages primarily served to desktop computers, and which was primarily understood through the theoretical frameworks of Computer-mediated communications, audience research and socio-technical approaches in which users were positioned as consumers of specific content."[109]

At least in the early days "web 1.0 was generally passive and as quiet as a library. It was an information depository running on slow dial-up modems and AOL. Rudimentary search engines like AltaVista helped you find things by sorting category tags, and you went there essentially to read."[110]

A large number of websites are still functioning in Web 1.0 mode. These are websites which are focused only on publishing information to users with no intention to use the web as the medium of any possible further interaction. In fact, Mitra[111] is of the opinion that "most e-commerce websites are still Web 1.0 in nature since the concept behind them is simple. Present products to the customers and take money from the ones who are interested".

b) Web 2.0 – two-way interaction

The term, Web 2.0, was introduced by "O'Reilly Media in October 2004."[112]

Chawinga and Zinn describe it as follows:

> "Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation' and going beyond the page metaphor of Web 1.0 to deliver rich user experiences."[113]

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[109] Kreps and Kimppa. 2015. Guest editorial theorising Web 3.0: ICTs in a changing society. 732

[110] Castelluccio M. 2018. Toward Web 3.0. 53 Available: https://sfmagazine.com/post-entry/december-2018-toward-web-3-0/

[111] Mitra. 2020. What is Web 3.0? The evolution of the Internet. Available: https://blockgeeks.com/guides/web-3-0/

[112] Rudman and Bruwer. 2016. Defining Web 3.0…. 135

[113] Chawinga and Zinn. 2016. Use of Web 2.0 by…. 2

The Web 2.0 came with an openness that allowed the free flow of information and access by anyone who can use the Web. As a result, "users see Web 2.0 as a platform that affords users an opportunity to participate in content creation and management, content that they can share

Web 2.0 is used for information dissemination and collaboration. "It includes technological tools, such as blogs, wikis, collaborative web sites and voice over IP that leverage the role played by internal and external agents in the use and spread of information….."[114] Technologies of the Web 2.0 are Tagging; Google Apps (i.e. Gmail, maps, etc.); user reviews; blogs; Wikipedia; YouTube; Facebook; Instagram; Twitter; LinkedIn; Dropbox; Podcasts; real simple syndication (RSS) feeds. These applications enable users to create and share their media without technical knowledge of how the Web work.

The technologies for Web 2.0 made it easy for people to create content and share with other people across the world. "Web 2.0 does not require users to have programming skills or specialist knowledge as the associated tools and technologies are simple to use and provide user-friendly ways to loosely share and process data sets between partners."[115] Or as Mitra also points out: "web 2.0's main aim was to make the internet more democratic and make it as user-accessible as possible."[116]

c) Web 3.0 – the 'intelligent' web

According to Aziz and Madani the "the third generation of web emerged in 2006 and it was termed the semantic web as suggested by John Markoff of the New York Times."[117] The intention is to extend Web 1.0 and 2.0 into an intelligent Web that allows human beings and intelligent machines to interact. "The website is learning from other users what your preferred choices can be and then use it to recommend to you what you may like. In essence, the website itself is learning and becoming more intelligent."[118] For this reason it is sometimes called the semantic web. An important consequence is expressed by Rudman and Bruwer who point out

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[114] Cámara et al. 2014. Cloud computing, Web 2.0, and operational performance: The mediating role of supply chain integration. 426

[115] Chawinga and Zinn. 2016. Use of Web 2.0 by…. 3

[116] Mitra. 2020. What is Web 3.0? The evolution of the Internet. Available: https://blockgeeks.com/guides/web-3-0/

[117] Aziz and Madani. 2017. Evolution of the Web and its uses in healthcare. 246

[118] Mitra. 2020. What is Web 3.0? The evolution of …

that "web 3.0 creates the opportunity for collaborative and *autonomous integration* and distribution of data on the web."[119]

Whereas in stages 1 and 2 of web evolution the internet was merely a conduit for either one-way or two-way communication, and the web was merely publication terminals of the communication, in web 3.0 the conduit becomes itself an active participant in the interchanges. At any point specific technologies can be drawn on to shape or modify the human to human communication for the benefit of either or both parties.

For this reason, web 3.0 has come to be associated with the notion of the 4th industrial revolution (4IR) which captured the imagination of many since 2015. According to the World economic forum:

> "Previous industrial revolutions liberated humankind from animal power, made mass production possible and brought digital capabilities to billions of people. This Fourth Industrial Revolution is, however, fundamentally different. It is characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human."[120]

Or as the World Economic Forum formulated it in 2016 "4IR is described as the advent of 'cyber-physical systems' which represent entirely new ways in which technology becomes embedded within societies and even our human bodies."[121]

The technologies of 4IR are largely also the technologies of web 3.0

After a summary of the 3 stages in the table below, we turn to an overview of the technologies mostly associated with web 3.0

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[119] Rudman & Bruwer. 2015. Web 3.0: Governance, risks and safeguards. p1045

[120] World Economic Forum. 2019. The Fourth Industrial Revolution, by Klaus Schwab.

Available: https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab

[121] World Economic Forum. 2019. What is the fourth industrial revolution?

Available: https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/

Web 1.0	Web 2.0	Web 3.0
1991	2004	2006
Informal	Social Web	Semantic Web
Tim Berners Lee	Tim O Reilly	Tim Berners Lee
Read-only	Read and write	Read, write and execute
Distribution	Communication	Engagement
Connect information	Connect people	Connect knowledge
Text and graphics-based flash	2D portals, Wikis, videos, Personal publishing	3D portals, avatar, representations, integrated game, and business
Content published by providers to Consumers	Content published by people or companies and other people can consume and publish content to other people, such as YouTube, flicker.	Applications built by people or companies so that others can interact with it and publish services, such as Facebook, Google maps.
Search engines retrieve macro contents very fast, but many times results are inaccurate, or more than users need.	Search engines retrieve tags with micro-contents. The tagging is manual and covers a small percent of the WWW. It tags everything: pictures, links, events, news, blogs, audio, etc.	Search engines retrieve micro content texts and tag automatically, so it translates billions of Web 1.0 macro contents into micro contents, resulting in a more precise search.
The content was static, one-way publishing without any real interaction between readers or publishers.	It is a two-way communication through social networking.	It is undefined and delivers to you a personalized web experience.
The web in the beginning when it was first developing web 1.0	Sophisticated user interaction with web pages.	More interactive with users, leading to a kind of artificial intelligence.
Personal web sites	Blogs	Semantic blogs such as Semi Blog and haystack
Content Management system	Wikis, Wikipedia	Semantic Wikis: Semantic Media-Wiki

Table 4.4 - Aziz and Madani: summary of the differences among the web generations.[122]

4.3.2 Overview of advanced web 3.0 technologies

a) Big data

Muhammad and Syamimi explain that "Big data is defined as an extremely large volume of

[122] Aziz and Madani. 2017. Evolution of the…. 247

data designed to extract value for forecasting or decision-making."[123] / [124] It is thus a term that describes both volume and complexity.[125] Through the interconnected of smartphones, smart devices, and machines, large amounts of data are created that may be of use at any given time.

By applying advanced data scientific technologies, such as machine learning, governments can benefit from predictive statistics, machine learning and trend analysis."[126] Ideally, this can transform the use of government's online web presence, where citizens' data can be reaped [127] and better services delivered.[128] / [129] / [130] Importantly it can "assist in designing public services to trigger innovation, stimulate business opportunities, speed up public services, and create knowledge sharing across the community."[131] / [132]

Big data sources range from social networks, open government data to government websites where citizens place their information to engage government. "One of the most important sources for big data in the public sector is the open data and Open Government Data."[133] Open data originates when people share and generate data with the public from various means such as social networks, apps, and weblog activities. Not only accountability and transparency are increased by open data, but various benefits are provided.

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[123] Muhammad & Syamimi. 2017. E-Government with Big data enabled through a smartphone for public services: possibilities and challenges. 1143

[124] Sarah. 2017. Big data for policymaking: fad or fast track?. 376

[125] Sarah. 2017. Big data for policymaking: fad or fast track?. 367

[126] Muhammad & Syamimi. 2017. E-Government with Big data enabled through a smartphone for public services: possibilities and challenges. 1143

[127] Sarah. 2017. Big data for policymaking: fad or fast track?. 374

[128] Muhammad & Syamimi. 2017. E-Government with Big data enabled through smartphones for public services: possibilities and challenges. 1153

[129] Sarah. 2017. Big data for policymaking: fad or fast track?. 374

[130] Muhammad & Syamimi. 2017. E-Government with Big data enabled through smartphones for public services: possibilities and challenges. 1153

[131] Muhammad & Syamimi. 2017. E-Government with Big data enabled through smartphone for public services: possibilities and challenges. 1144

[132] Kosorukov. 2017. Digital government model: theory and practice of modern public administration. 6

[133] Muhammad & Syamimi. 2017. E-Government with Big data enabled through smartphones for public services: possibilities and challenges. 1146

b) Artificial Intelligence

Artificial intelligence (AI) is a computer engineering discipline that is made up of software tools that are designed to solve problems. The AI is a technology that can-do things that humans are already better at doing them. "Artificial intelligence applies advanced analysis and logic-based techniques, including machine learning, to interpret events, support and automate decisions, and take actions."[134]

Centre for Public impact broadly defines that, AI is software that enhances and automates the knowledge-based work conducted by humans.[135] As result when AI is combined with human intelligence, service quality is enhanced.

AI is capable of learning, reasoning and solving problems. "AI techniques have been extensively used to support and enhance the quality of decision making and problem solving in different industries for many years."[136]

As much as human brain is multi layered, so is the AI. "AI covers various concepts and processes. Whereas human intelligence is supported by our brains and senses, AI is informed by all sorts of technology (Robotics, Big Data, Sensors, Internet of Things, Speech Recognition)."[137]

Figure 4.3 below articulates predicted artificial intelligence developments that suggests that in the years to come, AI will be surpassing human intelligence. This shows that the more AI is being used in various sectors it will be more powerful to such an extent that is intelligent than human beings.

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[134] Gartner. 2020. Information technology glossary: Artificial Intelligence.

Available: https://www.gartner.com/en/information-technology/glossary/artificial-intelligence

[135] Centre for Public Impact. 2017. Destination unknown: Exploring the impact of Artificial Intelligence on Government. Available: https://publicimpact.blob.core.windows.net/production/2017/09/Destination-Unknown-AI-and-government.pdf . 1

[136] Androutsopoulou et al. 2018. Transforming the communication between citizens and government through AI-guided chatbots. 358

[137] Capgemini. 2017. Unleashing the potential of Artificial Intelligence in the Public Sector. Available: https://www.capgemini.com/consulting/wp-content/uploads/sites/30/2017/10/ai-in-public-sector.pdf. 2

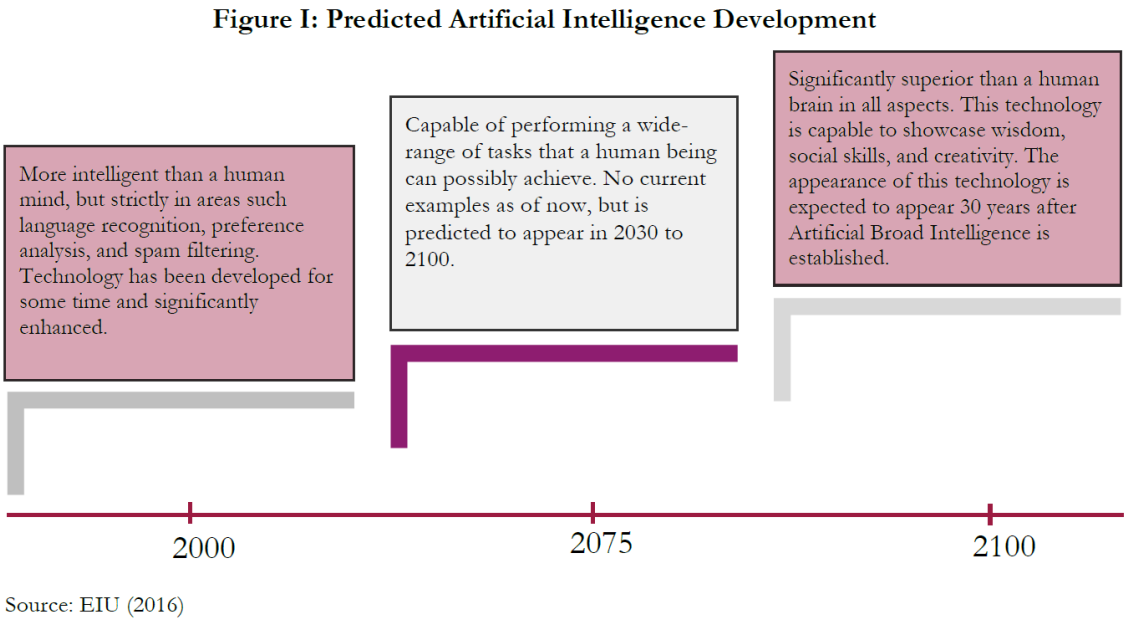

Figure 4.3: Predicted artificial intelligence development[138]

AI is known as the ability of private institutions or government to apply intelligent solutions such as machine learning, deep learning, and algorithms to data with an intent to ensure that value is created. For example, "residents' tweet about the presence of potholes, and an algorithm collates and summarizes the information, and suggests the most efficient way to deal with the problem".[139] In this way, the government will be applying AI to engage citizens and solve problems proactively.

According to Neil:

> "the power of digital government lies in making all the data that governments collect and generate available to both government officials and the public. In this way, citizens not only find useful information but also gain insight into how the state is working."[140]

Data that can be made available can range from crime statistics, spending on education, health, and demographic statistics. The government can apply AI to these sets of data, so that data has more meaning for citizens to gain insights.

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[138] Centre for Public Impact. 2017. Destination unknown… 6

[139] Neil. 2018. Digital citizens. p137

[140] Neil. 2018. Digital citizens. p136

The application of AI to data can provide various benefits to the government. Benefits can range from data that assists in the combating of crime to the identification of potential terrorism. The Centre for Public Impact expressed that, with AI, police departments have the ability to use the predictability of criminal activity to their advantage."[141] Neil support this perspective by saying "Applying artificial intelligence to government data could help to fight crime and terrorism, improve economic decision-making, and cut the costs of doing business internationally."[142]

"Applying predictive analytics could help police departments to work out how best to allocate their resources."[143] Centre for Public Impact support this notion by reporting that "AI can help both policymakers and frontline civil servants to make predictions in a way that is more comprehensive and less subject to human bias". Also, it can help in detecting terrorist plans and other security threats that might jeopardise the government and citizens.

Neil points out that, "the main component of digital government is providing citizens with easy access to their information."[144] The provision of citizens with their information is better when the government applies AI to data collected. Information is easily accessed when citizens are provided with targeted and personalised services.

The AI capabilities range from automated intelligence, autonomous intelligence to augmented intelligence, and assisted intelligence. All these intelligent capabilities provided by AI enable the government to solve challenges quickly and ensure that service delivery is efficient and effective. Through AI some of the government inefficiencies can be alleviated. "AI has been shown to speed up services, improve on human accuracy, reduce the number of people necessary to fulfil specific tasks and organise sophisticated ideas via expertise analysis".[145]

The first AI capability described by the World Economic Forum is "Automated intelligence systems that take repeated, labour-intensive tasks requiring intelligence, and automatically

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[141] Centre for Public Impact. 2017. Destination unknown… p15

[142] Neil. 2018. Digital citizens. p136

[143] Neil. 2018. Digital citizens. p137

[144] Neil. 2018. Digital citizens. p137

[145] Centre for Public Impact. 2017. Destination unknown… p10

complete them."[146] An example of this AI can be a robot that pays citizens claims without human involvement.

The second AI capability as described by the World Economic Forum is

> "Assisted intelligence systems that review and reveal patterns in historical data, such as unstructured social media posts, and help people perform tasks more quickly and better by using the information gleaned."[147]

Use of AI to source information from social media platforms to identify problems and gauge public sentiment can affect agenda setting by helping governments aggregate and analyse the interests of the population through various sensors.[148]

Centre for Public impact explained that

> "In 2015, Las Vegas health department helped implement restaurant sanitation laws and health inspection processes by piloting an app that combs through Twitter posts about food poisoning. The department switched from random restaurant inspections to inspecting restaurants about which people had recently tweeted about food poisoning. AI helped identify the tweets and link them to the restaurants. The tweet-based system increased the rate of health citations by two-thirds, from 9 percent using random searches up to 15 percent of inspections with AI."[149]

An example of this AI is the use of deep learning processes to predict and uncover incidents such as hurricanes and bad weather before they happen. These can be used by the government to inform citizens and plan for bad weather.

The third AI capability as described by the World Economic Forum is "augmented intelligence systems that use AI to help people understand and predict an uncertain future."[150] For example, augmented reality enables people to use computers to have an interactive experience with the objects that reside in the real world. This happens without physically being in the environment but being there using computer-generated perceptual information.

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[146] World Economic Forum. 2018. Harnessing artificial intelligence for the earth. p7

[147] World Economic Forum. 2018. Harnessing artificial intelligence for the earth. p7

[148] Centre for Public Impact. 2017. Destination unknown… p27

[149] Centre for Public Impact. 2017. Destination unknown… p31

[150] World Economic Forum. 2018 Harnessing artificial intelligence for the earth. p7

The final AI capability as described by the World Economic Forum is:

> "autonomous intelligence systems that automate decision-making without human intervention. This system can identify patterns of high demand and high cost in home heating, adapting usage automatically to save homeowner money."[151]

Another example of autonomous intelligence is self-driving cars.

According to Joshi and Islam "automation is the fully mature state of e-governments where users are proactively involved in government activities and government services are transformed from a push to a pull format."[152] Through the use of automation, government services become smarter as services such as renewal of licenses, unpaid bills, yearly tax submissions are automated. In fact, AI may help shape a new role and give new legitimacy to governments in general.[153] "This new digital communication channel has the potential to transform and improve substantially the communication between citizens and government."[154]

c) Blockchain

The term blockchain is referred to as a data structure that allows recording and updating of distributed ledger that links chains of blocks of transactions. "A blockchain is a type of distributed ledger which enables an agreed record of transactions to be maintained and replicated across multiple participants."[155] This takes place without the involvement of central authority operating the system. The blockchain is a technology that enables records to be tracked and trusted as a single version of the truth. Gartner defines a blockchain as:

> "an expanding list of cryptographically signed, irrevocable transactional records shared by all participants in a network. Each record contains a time stamp and reference links to previous transactions. With this information, anyone with access rights can trace back a transactional

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[151] World Economic Forum. 2018. Harnessing artificial intelligence for the earth. 7

[152] Joshi and Islam. 2018. E-Government maturity model for sustainable E-Government services from the perspective of developing countries. 11

[153] Capgemini. 2017. Unleashing the potential of Artificial Intelligence in the Public Sector. Available: https://www.capgemini.com/consulting/wp-content/uploads/sites/30/2017/10/ai-in-public-sector.pdf. 2

[154] Androutsopoulou et al. 2018. Transforming the communication between citizens and government through AI-guided chatbots. 366

[155] World Economic Forum. 2019. Figuring out Blockchain's most useful applications. Available: https://www.weforum.org/agenda/2019/06/unpicking-the-components-of-blockchain-and-their-possible-applications/

event, at any point in its history, belonging to any participant. A blockchain is one architectural design of the broader concept of distributed ledgers."[156]

Types of information that can be stored, include identity validation, electronic voting, personal health information, financial transactions and applications. Blockchain has three characteristics: (1) a distributed network, (2) peer to peer exchange, and (3) the use of cryptography.[157]

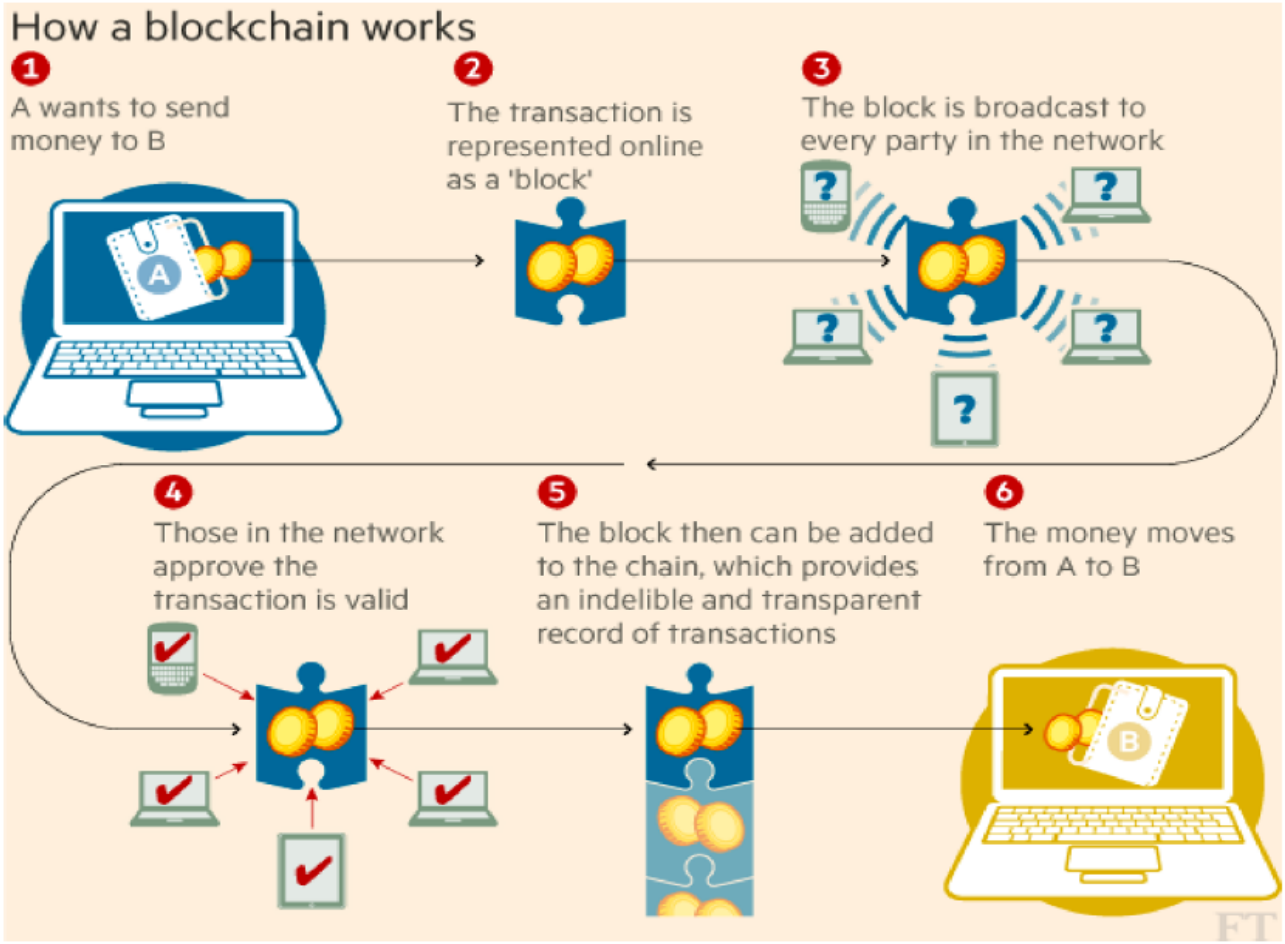

Figure 4.4: How blockchain works. World Economic Forum (WEF)[158]

The World Economic Forum explains that "a blockchain is a decentralised data repository

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[156] Gartner. 2020. Information technology glossary: Blockchain. https://www.gartner.com/en/information-technology/glossary/blockchain

[157] Kimani et al. 2020. Blockchain, business and the fourth industrial revolution: Whence, whither, wherefore and how?... 1

[158] Kimani et al. 2020. Blockchain, business and the fourth industrial revolution… 2

which provides an immutable record of transactions performed across a network."[159] The use of blockchains eliminates the need for intermediaries.

According to Christian:

> "at a high level, blockchain technology allows a network of economic agents (e.g., individuals, firms, devices) to reach consensus, at regular intervals, about the true state of some jointly maintained and shared data. Such shared data can represent exchanges of cryptocurrency (as in Bitcoin) and other types of digital assets, making the technology applicable to multiple industries and public-sector verticals."[160]

The blockchain consists of various features that track data trails and provide security to protect data. Christian articulates that, "the potentially most important feature of blockchain technology from a cybersecurity perspective is its use to establish immutable audit trails and data integrity."[161] The audit trails protect the integrity of data.

Amazon web services find that:

> "blockchain technology provides three core economic benefits to many processes: commitment, coordination, and control. Due to blockchain's tamper-resistant record-logging features, the first benefit – commitment – can reduce risk in government procurement through an increase in data record integrity and credibility of publicly available information. This will be particularly beneficial in enabling contractor selection and monitoring performance."[162]

The procurement processes in government are crowded by bribery and corruption. The introduction of blockchain will help in fighting bribery and corruption in government procurement processes.

d) Robotics

Robotics are designed intelligent machines that can help and assist humans in their day to day

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[159] World Economic Forum. 2019. Eliminating waste at scale: opportunities for blockchain. Available: https://www.weforum.org/agenda/2019/04/eliminating-waste-at-scale-eight-opportunities-for-blockchain/

[160] Christian. 2018. Blockchain technology and cryptocurrencies. 36

[161] Christian. 2018. Blockchain technology and cryptocurrencies. 39

[162] World Economic Forum. 2019. Here's how blockchain could stop corrupt officials from stealing school lunches. Available: https://www.weforum.org/agenda/2019/05/heres-how-blockchain-stopped-corrupt-officials-stealing-school-dinners/

lives. According to Keisner et al

> "Robotics is the field of technology that drives the development of robots for application in areas as diverse as car factories, construction sites, schools, hospitals, and private homes. Industrial robot arms have been in use in automotive and other manufacturing businesses for more than three or four decades. However, various strands of existing and newer research fields such as artificial intelligence (AI) and sensing, have been combined in more recent years to produce autonomous and 'advanced' robots for widespread use in the social and economic spheres."[163]

Robotics are defined as a combination of related engineering practices that comprise concepts, designs, manufacturing, and operation of robots. "Robots are machines that sense, compute, and take action."[164] A robot require instruction from human being to complete an action. The type of instructions delivered to a robot comes from applications that are coded by developers. An example of a robot is a machine that is used in a warehouse to do repetitive tasks such as inventory distribution and provision of customer service in retail stores. Other examples of robots are use of drones.

Robotics have been in used for many decades. However, they have evolved to integrate emerging technologies. "The history of robotics started in ancient Greek with automatons, essentially non-electronic moving machines that displayed moving objects. The invention of simple automatons continually evolved thereafter, but robots in their current form took off with the process of industrialization, essentially to perform repetitive tasks."[165]

The Robot learns over time with an intent to improve how tasks are handled.

> "Robotics applications use machine learning to perform more complex tasks like recognizing an object or face, having a conversation with a person, following a spoken command, or navigating autonomously."[166]

The government can deploy robots in hospitals or shopping complexes to dispatch repeating prescriptions for patients. Citizens can at any time go to automated machines that allow them

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[163] Keisner et al. 2016. Robotics: Breakthrough Technologies, Innovation, Intellectual Property. 8

[164] Amazon web services. 2019. AWS RoboMaker. Available: https://aws.amazon.com/robomaker/?hp=tile&so-exp=below

[165] Keisner et al. 2016. Robotics: Breakthrough Technologies, Innovation, Intellectual Property. 9

[166] Amazon web services. 2019. AWS RoboMaker. Available: https://aws.amazon.com/robomaker/?hp=tile&so-exp=below

to refill their medicines. The processes happen seamlessly where a human being is not involved in dispensing out medicine. This eases the burden of long queues at hospitals and frustrations that citizens have with government service delivery. Robots are one of the emerging technologies shaping digital government.

4.4 Conclusions

This chapter provided an overview of the DEWEM framework. As far as could be ascertained this is the only integrated and comprehensive instrument to evaluate websites from the point of view of governance.

The big advantage of the DEWEM is that it is constructed on a very wide base of literature over the past 15 years. When compared to the studies referenced in chapter 3, it is clear that the DEWEM encapsulates and incorporates all the critical dimensions of website analysis from the perspective of service quality. But, as was argued in chapter 3, a website evaluation based only on service quality, does not honour the character of a government communication adequately. It measures functionality, but not governance. The DEWEM on the other hand is a deliberate attempt to make governance the primary target of the evaluation. It, therefore, goes beyond the conventional service quality evaluations, and links them to the special purpose of governmental websites, i.e. governance.

It, thereby, incorporates much, if not all, of the movement – described in chapter 3 – in the circles of the OECD, the EU and the UN to utilise governmental websites for the advancement of democratic values and practices. In these movements, governance is linked to democracy. This is in line with the constitution of South Africa and it is for that reason an appropriate measurement framework for this thesis.

In the next chapter the use of DEWEM for the analysis in this thesis will be described.

Chapter Five

A measurement instrument and data presentation

5.1 Introduction

In the previous chapter, the DEWEM framework which forms the platform for the analysis in this thesis, was described.

It was noted, however, that the DEWEM framework was a conceptual construction. Its intention is to provide us with a heuristic comprising all elements identified in literature to date, regarding governmental websites. DEWEM is, for that reason, not an off the shelf instrument.

In this chapter:

a) the customisation of DEWEM for the purposes of the research will be explained

b) as well as the methodological considerations in applying the customised instrument

c) the data presented that was yielded by the instrument.

5.2 Turning DEWEM into an instrument of analysis

In figure 4.2 and in tables 4.1, 4.2 and 4.3 the structure and content of DEWEM was presented in the previous chapter.

In trial runs of using the criteria listed in the 3 dimensions, two areas in need of improvement soon became clear.

Firstly, the various criteria, derived as they are from an aggregating and weighting of literature,

are so generic in some cases that they are almost without context. Using them without clear definitions and demarcation, results in meaningless results.

This was foreseen by the authors who state: "this model provides comprehensive criteria, but it is not a one-size-fits-all framework…. Although we do not assume it is necessary to eliminate any criteria in DEWEM as it is built based on the general factors that apply to all levels of government…[it still is necessary] to distinguish the requisite variables in common from customizable or eliminable variables, to properly implement the specifics purpose of each website."[167]

This latter remark is in connection with the different purposes of local government websites compared to national government. In this thesis the emphasis is on national government and it was not experienced that some criteria were "eliminable" from that point of view. However, the need to *specify some criteria and ringfencing what they measure* was experienced.

Secondly, alerted by the cautioning by Bindu et al to the effect that a technological frame of reference is required, the DEWEM does not adequately incorporate such a perspective. As the DEWEM is a literature-based product, and as the majority of literature in this field focus purely on functionality from a client and user perspective, it does not surprise that technological criteria do not feature.

In applying the DEWEM in the trial run, it soon became evident that this omission may severely skew the overall assessment. The reality is that the internet, and the WWW, is a moving target, *because ongoing technological innovations change the scope and efficiency of websites over time*. What is today possible on the internet platform is markedly different and more powerful than what was the case in the first decade of the century (or even 5 years ago). Without taking technological opportunities into account, a website easily scores very high in service quality because the website had mastered web design of 20 years ago very well. When, however, the same website is evaluated from the perspective of present web technology and service possibilities, it becomes clear what services citizens are deprived of. A high score would then provide a false picture of the present efficiency of the website.

To counter this, a section was added in the service quality dimension to identify the technological nature of the particular website. Although Bindu et al argue for a 5-level technology framework (see figure 3.4), it was opted for in this thesis to apply the more common

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[167] Lee-Geiller and Lee. 2019. Using government websites to enhance democratic E-governance... 223

3-level framework, as discussed in the previous chapter. Consequently 3 criteria – as described in the previous chapter - were added to DEWEM in the service quality dimension under the category of technical levels.

The levels are distinguished according to the type of interaction between the departmental website and citizens. In level 1 there is only a one-way communication from the department to the user. This type of communication consists predominantly of information push. In level 2 the communication moves both ways. This is predominantly a matter of transactional relationships (such as paying for a service online or submitting requests). In level 3, through the application of AI technologies, there is agency *in* the interaction itself.

Thirdly, one criterion was found to be tautological and was scrapped. This criterion appears under the category "Open accessibility" in the dimension Transparency. Also, on criterion under the sub-section of "Quality of information" was deemed far too subjective to be reliably measurable by only pursuing textual and content analysis. This criterion was replaced by one focusing on multilingual provision of information. After all, in South Africa there are 11 official languages and it is, therefore, quite legitimate to expect government websites to be multilingual.

The changes made to DEWEM, as well as the ringfencing of some criteria, are indicated in table 5 below in the form of red text.

5.3 The instrument of analysis

This section describes the specific adaptations to each dimension of DEWEM and then presents the instrument as it was employed in the analysis of departmental websites.

5.3.1 Transparency

This dimension measures the extent and quality of the *information* made public via a website. *It is important not to confuse information transparency with services*. It is quite conceivable that a citizen may expect full information in connection with passport applications, but still have to pay for the document itself (being a service). Factor 1(c) can, for instance be misinterpreted if it is not clearly understood that this dimension is an *abstraction* from reality and devoted to information only.

But exactly what the boundaries of information are, is at the best of times hazy. When, for instance, does information become purely historical documentation? When a site contains reports of a decade or more ago, can it still be considered information? Around the topic of

information and the assessment of the quality of information a measure of subjectivity must be accepted. In the example above, a historian might find documents of a decade ago more informative than current website content. But the average user of the website will most likely consider current information as the only useful information. The latter is the position that was taken in interpreting the selected websites.

In this respect there is an association with the ideal of open data flows as formulated by the OECD. Such an understanding of information is a clear preference for utilising the web as a means of supporting democracy by empowering citizen engagement. It also, then, links the dimension of transparency to the dimension of citizen engagement.

A uniquely South African consideration – when it comes to transparency in particular – is the fact of 11 official languages. Therefore, a website cannot be said to be properly transparent if it is not – at least partially – available in the official languages. For that reason, criterion (g) was added under the section of quality of information, to reflect this element.

5.3.2 Service Quality

"The service quality dimension evaluates the extent to which government websites enable governments to deliver public services smoothly to meet the expectations of citizens."[168]

Services are less hazy to conceptualise than information. It is, nevertheless, important to stress that the delivery of information should not be considered a service.

A fine distinction is required, though, between the website itself as a service, and services that are mediated by means of the website. The former requires a focus on the functioning of the site. The latter relate mostly to transactional type of activities (like query processing, subscriptions, document processing and financial payments). In such cases it is both a matter of whether such services are available through the website, and how functional the site is as a platform for the interactions.

A specific type of interaction is expressly excluded. That is when the transaction requires the user to leave the website and communicate by e-mail. This happens frequently when forms are posted on the website (usually in PDF) and the user is asked to download the form, and attached the completed version to an e-mail. This cannot be considered a service as the website merely functions as a one-directional post box.

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[168] Lee-Geiller and Lee. 2019. Using government websites…. 217

The most important change to the service dimension is the addition of a section which is additional to DEWEM. This is the section in which the website is assessed form the point of view of the type of technology that is evident in the way the website functions. This section follows the three-level framework that was described above.

5.3.3 Citizen Engagement

Whereas transparency and service quality implicitly require the government to be the first mover, the dimension of citizen participation views the website from the perspective of the citizen as the initiator of interaction. Can the citizen initiate involvement, in particular a critical involvement, by means of the website, and can that involvement be sustained within the confines of the website?

It is evident that such a possibility affords citizens a much more direct and on-going involvement with the governance of a country. As such it clearly enhances democracy.

At the same time, such a website requires applications derived from higher order (3rd level) technologies, as discussed in the previous chapters. There is, therefore, a close correlation between higher order technology and democracy in as much as websites are concerned.

5.3.4 The instrument

In table 5.1 below the consolidated measurement instrument, based on the platform of the DEWEM framework, is presented, after having made the adjustments and refinements that were discussed above.

The changes are indicated in red text. Also, in red are annotations to ensure the measurable focus of each dimension and/or segment.

Dimension Transparency (of information)

Key: How much, how up to date, how relevant to core functions of the Department is the information? Not to be confused with services.

Variable	Definition
Open accessibility	
(a) Non-discriminatory	Available to anyone with no requirement of registration (but single sign-on allowed for interoperability and services that are downloadable and transactional)
(b) Open license	Information not subject to copyright, privacy or security restrictions, and open licensed
(c) Free of charge	Information ~~and services~~ provided are available free of charge
(d) Non-proprietary	Information ~~and services~~ provided are in a format over which no entity has exclusive control
(e) System availability	Website is usable whenever needed (particularly for transactional actions)
(f) SNS/smartphone	Works in connection with other channels such as social media and smartphone applications (but not as duplications of website content)
Information disclosure	
Types of Information	
(a) Service standards	Disclosure of officially approved public service standards (Not vision and mission statements)
(b) Policy agendas	Disclosure of meeting agendas and decisions made by the department
(c) Broadcasting Website	provides links to watch live broadcasting of meetings
(d) Strategic plans	Disclosure of updated periodical activity reports on policy and strategy
(e) Performance reports	Disclosure of updated periodical performance reports
(f) Ethical commission	Publication of reports or activities of ethical boards
Quality of Information	
(g) Multilingual	Website and all content available in all official languages
(h) Timeliness	Publication of information is done in a timely manner (not last year's data, but reasonably recent)
(i) Level of detail	Information appropriately detailed (real detail, not summaries or broad outlines/focuses on information about current topics of public interest)
(j) Source indications	Indication of validity of information sources and link

Dimension: Service Quality

Key: Focus on services as facilitated through and by means of the website. Responses via e-mail do not qualify. Information is not a service

Variable	Definition
Interoperability of services	
(a) National coordination	Website is aligned, and linked throughout all levels of governments
(b) Accuracy	Website provides on-time and accurate services, functioning free from failure upon the first request
(c) Navigational structure	Website's structure is clear and easy to follow
(d) Content organization	(Information about) services are organized by categories
Visual elements	*Website looks clean and professional, using consistent layout, colour, and appealing multimedia features, regardless of technical variances such as resolution, browsers and different languages*
(e) Design	Website is designed aesthetically
(f) Resolution	Website performs appropriately regardless of different resolution levels
(g) Different browsers	Website consistent on phones and PC/laptop
(h) Language choices	Language options are available according to intended audience
(i) In-site search	Search-functions within the website are available functional and extensive
Processing capacity	*Website provides quick transactions*
(j) Page loading time	Pages load quickly
(k) Processing time	Tasks, such as file submission, upload, and downloading, are processed quickly
Credibility (reliability of service delivery functions)	
(a) Error management	Website is free from failure; in case of any, communication and management of errors are proactive
(b) Website guidelines	Guidelines or tutorials for website use by citizens are available
(c) Terms of use	Publication of specific service policies regarding terms of use in place
(d) Privacy	Personal data provided for authentication is used only for the reason submitted
(e) Safety	Acquisition of personal data is secure and archived securely
Technology levels	
(a) G to C	Information push. Non-reactive website. Posting of documents using PDF
(b) G to C to G	Two-way communication. Transactional. Sign-on required.
(c) G – AI – C – AI - G	Enhanced transactional. AI generated value add

Dimension: Citizen Engagement

Key: C initiated and critical engagement with G within the website confines

Variable	Definition
Political efficacy (of Citizens not of the department.)	
(a) Responsiveness	Inquiry/complaint page in which prompt replies and processing status are shown to support citizens to complete their tasks (such as listed below or to transact in services offered)
(b) Access to elected officials	Provides a *direct* communication channel with policymakers (not e-mail or phone)
(c) Participation support	Programs or activities to encourage citizen participation (like signing up for a webinar/meeting)
(d) Collaborative sharing	Presents the outcomes created through public deliberation and collaboration (like results from a Pulse poll/ summary of citizen proposals/ etc.)
Deliberation (Dept facilitating citizens' engagement via the website)	
(a) Questionnaires	Questionnaires on a variety of public issues to improve public services
(b) Collaborative tools	Employs tools designed for *collecting* citizen proposals, sharing ideas and local knowledge
(c) Commenting/ discussion	Website facilitates *dialog* with tools for making comments online
Collaboration	
(a) Voting and ranking	Tools to sort ideas and solutions through online voting and ranking tools
(b) Tools for collaboration	Provides ICT-mediated tools to allow effective collaboration between the citizens and the department for decision-making
(c) Performance assessment	Provides tools for citizens to partake in the department's performance assessment

Table 5.1 – Instrument of analysis adapted from DEWEM

5.4 Applying the instrument: methodological considerations

A website is a text with unique characteristics. Due to the capabilities that computation offers, a website combines written text, with graphics and possibly sound and video. Unlike written publications it is possible to construct a website in a way that link components to each other (and other websites) in multiple ways. Written publications are restricted to a single sequencing (of pages) and are normally of s singly documentary type. Websites, on the other hand can combine various types of communications and be store of large quantities of attached documents. Consequently, websites can be cognitively demanding as well as voluminous.

Despite these features, websites remain fundamentally texts. As such any study focusing on websites have to execute Textual and Content Analysis.

5.4.1 Textual Analysis

Textual analysis is a method that is used to analyse communication messages. According to Hawkins "textual analysis is a methodology that involves understanding language, symbols, and/or pictures present in texts to gain information regarding how people make sense of and communicate life and life experiences. Visual, written, or spoken messages provide cues to ways through which communication may be understood".[169]

Textual analysis can be applied to visual, written, or recorded texts to investigate messages portrayed within media, literature, public press, and personal interviews.[170] Hawkins provided an example that "Data are gathered and analysed to provide deeper understanding through description and interpretation of messages found within the text (or across texts). Texts may consist of, but are not limited to, a variety of the following items: books, photos, ads, interviews, performances, social media, film, television, and historical artifacts."[171]

The main methodological features of textual analysis are to describe, interpret and understand how language text, pictures and symbols are used in communication. The symbols may range from other languages, pictures, animations, sound and in-text linking to other texts.

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[169] Hawkins. 2018. Textual Analysis. In: *The SAGE Encyclopedia of Communication Research Methods.* 2

[170] Hawkins. 2018. Textual Analysis….2

[171] Hawkins. 2018. Textual Analysis…. 2

5.4.2 Content Analysis

Content analysis is a research methodology used to interpret the content of a text. According to Hsieh and Shannon "content analysis is an analytic method used in either quantitative or qualitative research for the systematic reduction and interpretation of text or video data."[172] Text or data that can be studied could be in a recorded information, conversations people are having or in the video. "content analysis is the study of recorded information, or information which has been recorded in texts, media, or physical items."[173]

"Content analysis is a research tool used to determine the presence of certain words, themes, or concepts within some given qualitative data (i.e. text)."[174] The data sources could be videos; books; magazines; newspapers; speech and interviews; web content and social media posts.

Some of the reasons for researchers to conduct content analysis are to find out how the use of communication impact the intended audience. "Researchers use content analysis to find out about the purposes, messages, and effects of communication content."[175]

Content analysis is particularly used to "interpret data by identifying codes and common themes (manifest content) and then constructing underlying meanings (latent content)."[176] The use of codes and themes helps the researcher to not be biased when gathering data.

The main methodological features of Content Analysis are evaluation, unit of analysis and abstract factors. "The aim of content analysis is to describe data as an abstract interpretation."[177] This it means that a researcher can decide to analyse set of words that can be counted or formulate criteria to analyse data.

For the analysis to take place a researcher needs to predefine themes, categories and unit of

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[172] Hsieh and Shannon. 2018. Content analysis. In: The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation. 2

[173] Lowa State University. 2020. Research methodologies guide. Available: https://instr.iastate.libguides.com/c.php?g=49332&p=318069

[174] Columbia University Mailman School of Public Health. 2020. Content analysis. Available: https://www.publichealth.columbia.edu/research/population-health-methods/content-analysis

[175] Luo. 2020. What is content analysis and how can you use it in your research?, in Scribbr. Available: https://www.scribbr.com/methodology/content-analysis/

[176] Hsieh and Shannon. 2018. Content analysis….2

[177] Hsieh and Shannon. 2018. Content analysis….2

codes prior collecting data or once a data has been collected then codes and themes can be generated. "It is important to identify a consistent unit of coding, which might range from a single word to short paragraphs. Coding serves to reduce and condense the data based on its content and meaning. Finally, the relationships between codes are constructed by arranging them within categories and themes."[178]

The outcome of the content analysis is "presented through descriptive writing but should be complemented with figures and tables as appropriate. Examples include conceptual diagrams showing the relationships between codes and themes or tables showing codes in rank order of use, potentially for different groups of study participants."[179]

In this thesis a combination of textual and content analysis is used. In keeping with the dictates of Content analysis, an instrument of analysis was designed, as described above, on the platform of the DEWEM framework.

5.4.3 Notes about coding

As already indicated above, the criteria listed in DEWEM are in some cases generalised. As described above, the instrument of analysis applied demarcations and definitions to such criteria in order to obtain clear data.

Even so, some criteria remain inherently subjective, either as a matter of taste, or as a matter of personal preference. In these cases, subjective assessments are unavoidable. However, the use of a simple binary mode of coding (yes/no) does afford a degree of objectivity as it eliminates the ranking of individual criteria.

The fact that coding based on yes/no (is a factor present or not) is crude at factor level (for example: a particular page in a website may be aesthetically attractive and user friendly, but other pages may not be. Even so, the fact that one instance of aesthetic attractiveness was found, means that the code of “yes” is accorded), becomes less of a problem when overall tendencies are observed and comparisons between criteria are done.

All in all, given the fact that no standardised frameworks are available to rank individual criteria, the use of the binary coding method seems to be the best at this stage of website

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[178] Hsieh and Shannon. 2018. Content analysis. In: The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation p3

[179] Hsieh and Shannon. 2018. Content analysis. In: The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation p3

assessments.

5.4.4 Selection of national government departments

With the emphasis on governance, and not only on technical website functionality, it is important to select departments that can be considered core to democratic governance. In the past decade the number of and names of departments have changed frequently. Rather than "chasing" departments, it is necessary to identify governance functions are not affected by political management.

A second perspective is to choose departments that have a broad exposure in society. These are departments who would maintain websites that, potentially, may be used by broad sections of the public on a regular basis.

Against this background, the following departmental websites were chosen:

1. Agriculture and Land Reform
2. Basic Education
3. Environment, Forestry and Fisheries
4. Health
5. Home Affairs
6. Human Resources
7. Mineral Resources and Energy
8. Public Enterprises
9. SA Police Service
10. SA Revenue Service (as the public face of the department of Finance)
11. Science and Innovation
12. Social Development
13. Tourism
14. Trade, Industry and Competition

5.5 Overall coding results

The results of the coding process are presented below for each of the three dimensions. As a first and raw tool for evaluation the green columns are added to show the percentage occurrence of a specific variable across all or per department.

TRANSPARENCY

VARIABLES	Agriculture, Land Reform, Rural Development	Basic education	Environment, Forestry, Fisheries	Health	Home Affairs	Human Settlements	Mineral Resources and Energy	Public Enterprises	SA Police Service	SA Revenue Service	Sience and Innovation	Social Development	Tourism	Trade, Industry and Competition	%
Open accessibility															
Non-discriminatory	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
Open license	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
Free of charge	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
Non-proprietary	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
System availability	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes	93
SNS/smartphone				yes				yes		yes				yes	29
Information disclosure															
Service standards			yes							yes	yes		yes		29
Policy agendas								yes			yes		yes		21
Broadcasting			yes												7
Strategic plans	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
Performance reports		yes	yes	yes		yes	yes	yes		yes	yes	yes	yes	yes	79
Ethical reports															
Multilingual															
Timeliness		yes			yes		yes	yes		yes	yes			yes	50
Level of detail	yes	yes		yes	yes		yes			yes				yes	50
Source indications			yes	yes	yes		yes	yes	yes	yes	yes	yes	yes	yes	79
%	44	56	63	63	50	44	63	69	44	75	69	50	63	69	

SERVICE QUALITY

VARIABLES	Agriculture, Land Reform, Rural Development	Basic education	Environment, Forestry, Fisheries	Health	Home Affairs	Human Settlements	Mineral Resources and Energy	Public Enterprises	SA Police Service	SA Revenue Service	Sience and Innovation	Social Development	Tourism	Trade, Industry and Competition	%
Interoperability															
National coordination															0
Accuracy	yes	yes						yes	yes	yes	yes	yes	yes	yes	64
Navigational structure		yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes	86
Content organization	yes	yes		yes	yes		yes	yes	yes	yes	yes	yes	yes	yes	86
Design		yes		yes		yes	yes	yes		yes	yes		yes	yes	64
Resolutions		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	86
Laptop/ PC's vs Phones	yes	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	93
Language choices															0
In-site search				yes		yes		yes		yes	yes	yes	yes	yes	57
Page loading time	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
Processing time				yes		yes				yes		yes		yes	36
	36	64	27	73	45	64	45	73	55	82	73	73	64	82	
Credibility															
Error management				yes				yes	yes	yes				yes	36
Website guidelines										yes					7
Terms of use		yes					yes			yes	yes				29
Privacy		yes								yes	yes				21
Safety		yes								yes	yes				21
	0	60	0	20	0	0	20	20	20	100	60	0	0	20	
Level of Internet Technology															
G2C - one way information push	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	100
G2C2G - two way interactions					yes		yes			yes		yes			29
G2G-AI-C2G - two way interaction mediated by automated intelligence										yes					7
%	33	33	33	33	67	33	67	33	33	100	33	67	33	33	

CITIZEN PARTICIPATION

VARIABLES	Agriculture, Land Reform, Rural Development	Basic education	Environment, Forestry, Fisheries	Health	Home Affairs	Human Settlements	Mineral Resources and Energy	Public Enterprises	SA Police Service	SA Revenue Service	Sience and Innovation	Social Development	Tourism	Trade, Industry and Competition	%
Political efficacy of citizens															
Responsiveness to inquiry/complaints								yes		yes					**14**
Direct communication with elected government officials															
Encouragement/promotion of participation															
Sharing collaborative products and outcomes															
Fascilitation of deliberation															
Questionnaires															
Collecting, sharing ideas				yes		yes									**14**
Tools for commenting/ discussion															
Fascilitation of collaboration															
Voting and ranking ideas or solutions															
Tools for collaboration															
Participatory performance assessment											yes				**7**
%				**10**		**10**		**10**		**20**					

5.6 Results from the dimension of transparency

The dimension of transparency comprises the sub-sections of accessibility and information disclosure. The results for these two sections are presented below in graphic format.

5.6.1 Open accessibility

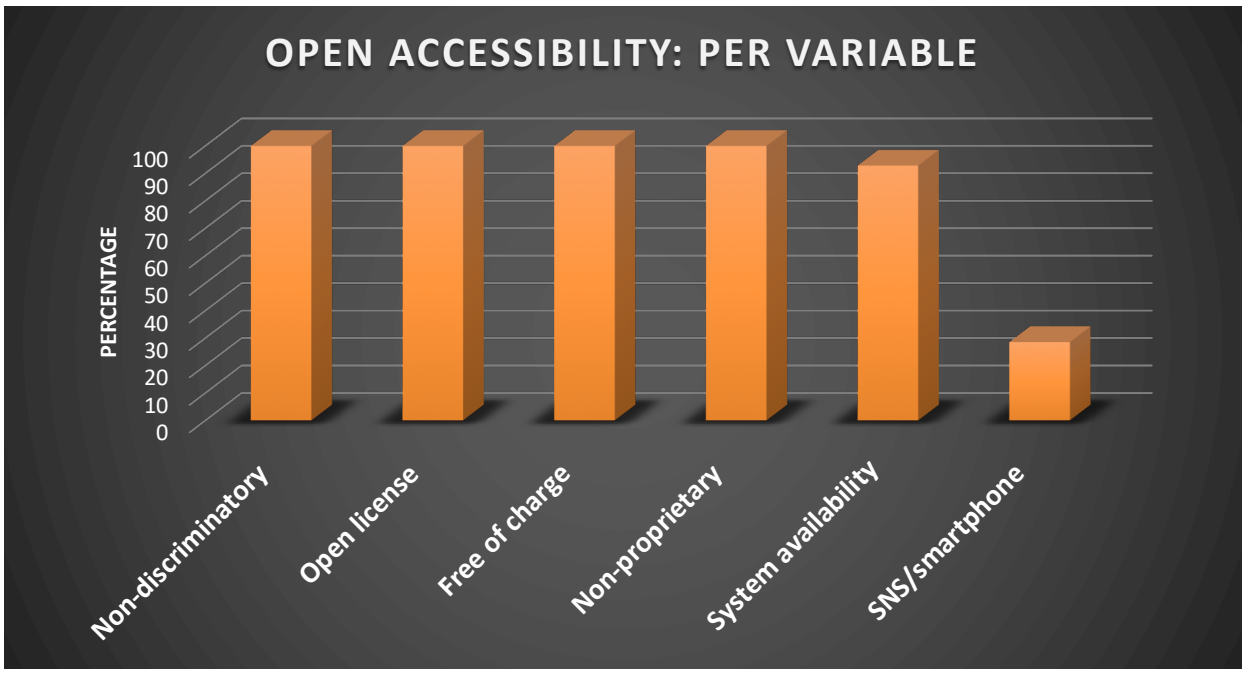

Figure 5.1 – Open accessibility per variable

5.6.2 Information disclosure

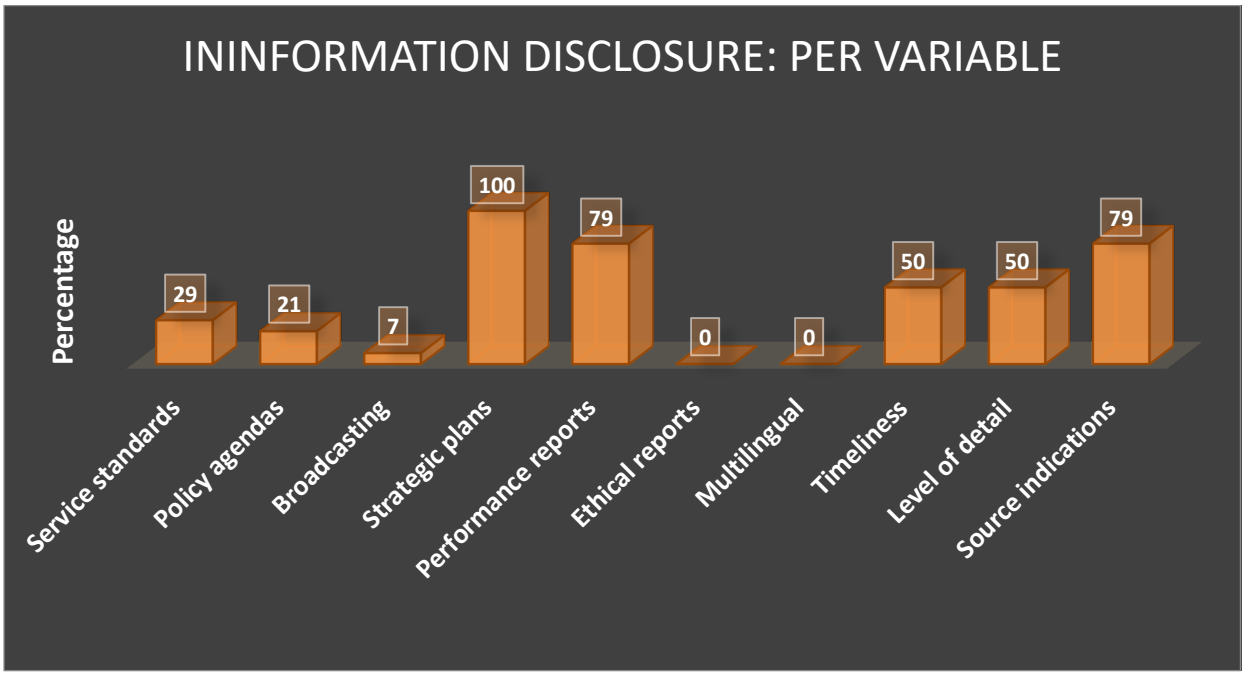

Figure 5.2 – Information disclosure per variable

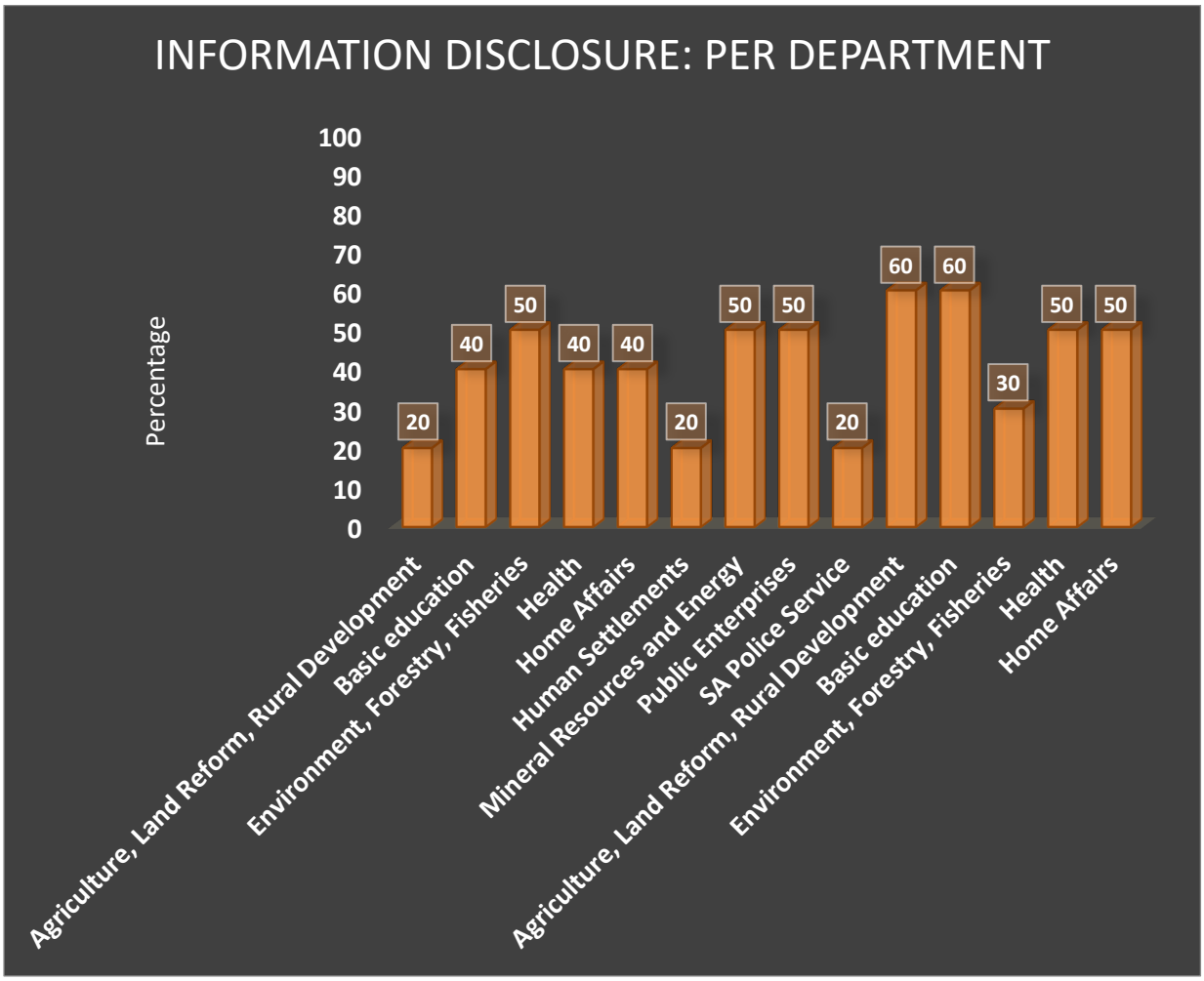

Figure 5.3 – Information disclosure per department

The data shows that the selected websites score very high on openness when evaluated from a purely technical perspective. Accessibility is only restricted with regard to the variable designated as SNS/smartphone. Of all the accessibility variables, this is the only one that functions at level 2 or 3 of the technology types.

In stark contrast to accessibility, of all the variables in the section on information disclosure, only 2 departments score higher than 50% and only 7 out of 14 reach the 50% mark.

When the profile is analysed from the perspective of specific variables, the picture looks even worse. Only strategic plans, performance reports and source indications rise above 50%. What should be considered more important, such as multilinguality and ethical reporting are totally absent.

The analysis of the dimension of transparency, thus, paints a picture of formal functionality but substantive under-performance.

5.7 Results from the dimension of service quality

This dimension comprises three sections. The results are presented below in graphic format.

5.7.1 Interoperability

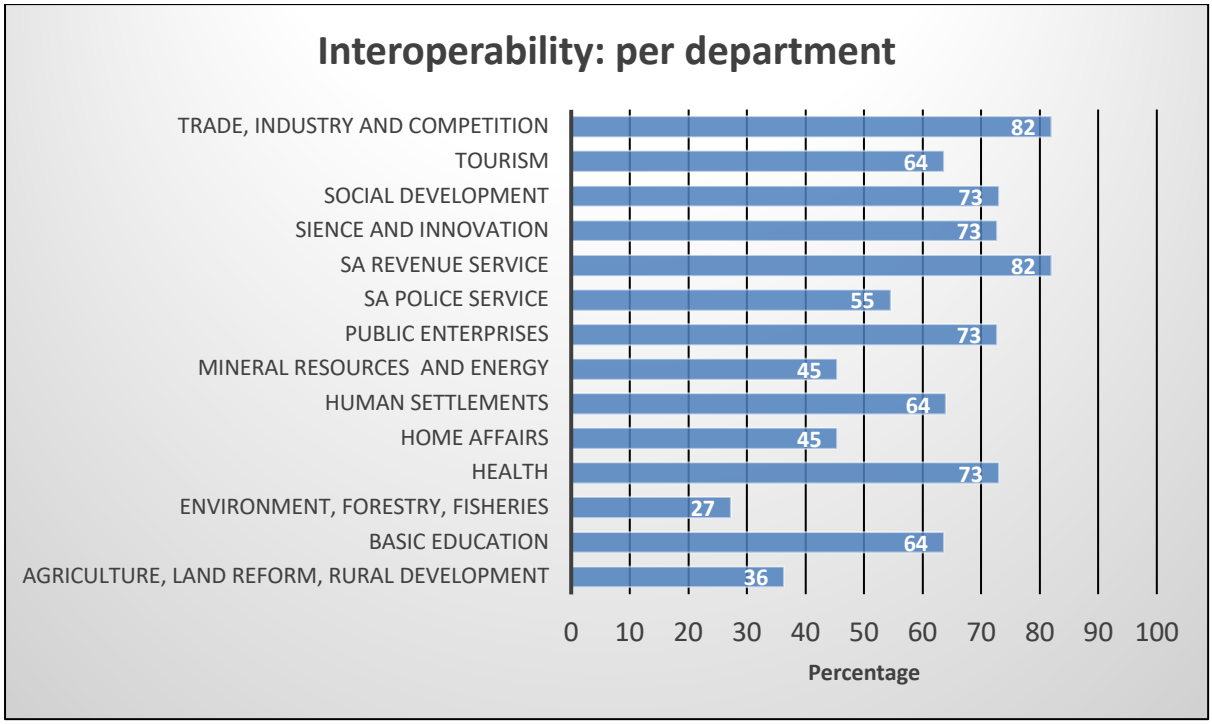

Figure 5.4 – Interoperability per department

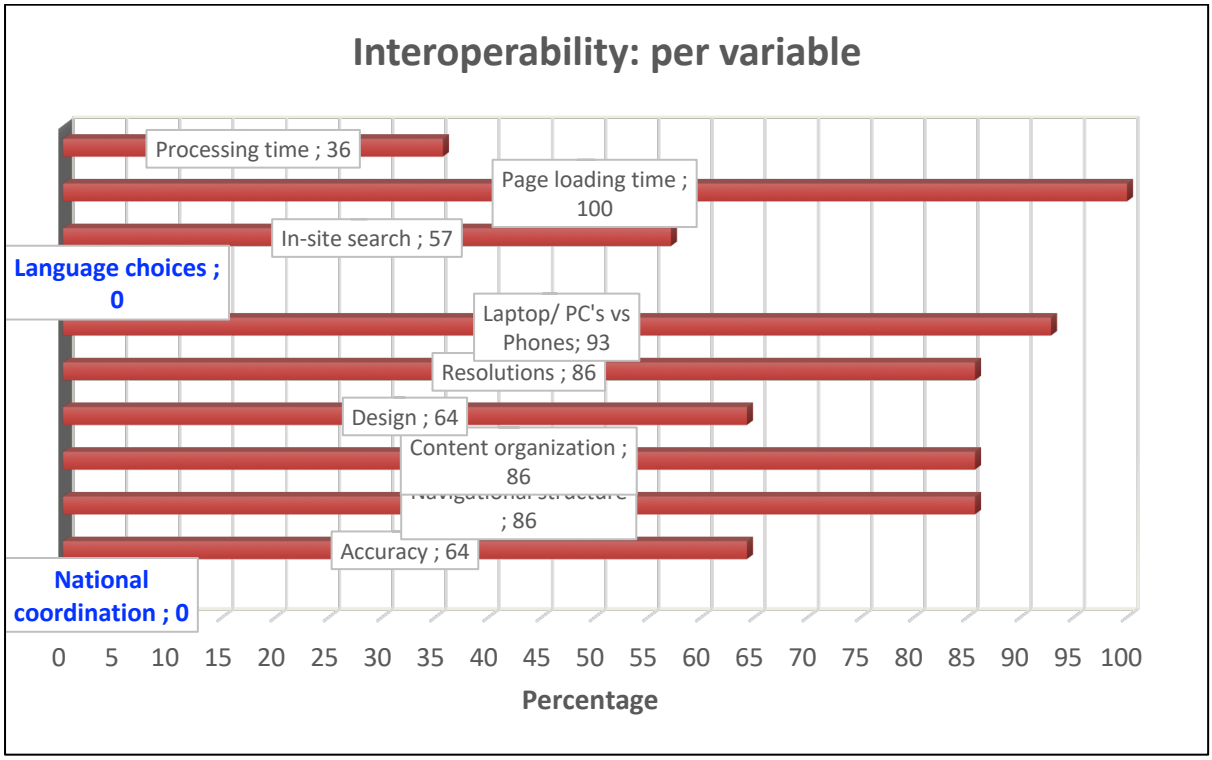

Figure 5.5 – Interoperability per variable

Overall, the majority of departments do reasonably well on the interoperability factor. Only two departments are clearly lagging.

However, a closer look at the specific variables lead to the same profile as is the case with accessibility. With the exception of loading time, all variables that measure purely technical functionalities score high. At the same time, it must be noted that such variables are all related to level 1 of internet technology. The picture is different with 3 variables that, each in a different way, require at least level 2 internet technology. These are: in-site search, language options and national coordination.

The conclusion has to be that websites, as longs as they are designed according to level 1 internet technology, are reasonably interoperable – but this applies *only* to the sub-world of a department. Interoperability across government departments is not evident. In fact, websites operate in silos.

The lack of governmental integration, which needs a far more sophisticated internet technological platform, becomes apparent in the absence of any form of single-sign-on. It also makes a multilingual offering of content impossible.

This is even more clearly illustrated in the next factor.

5.7.2 Credibility

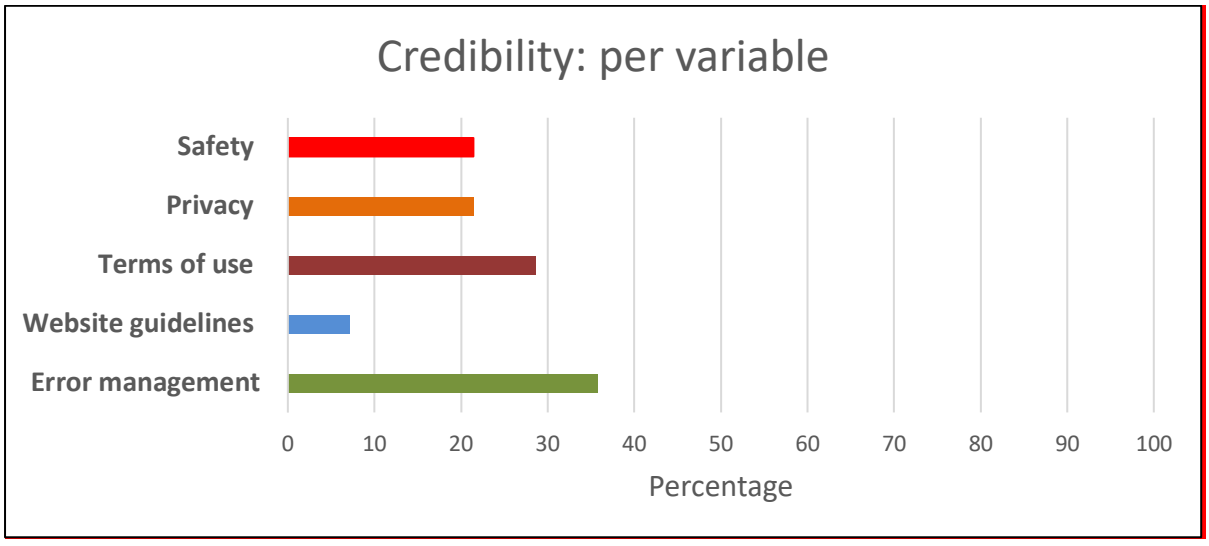

Figure 5.6 – Credibility per variable

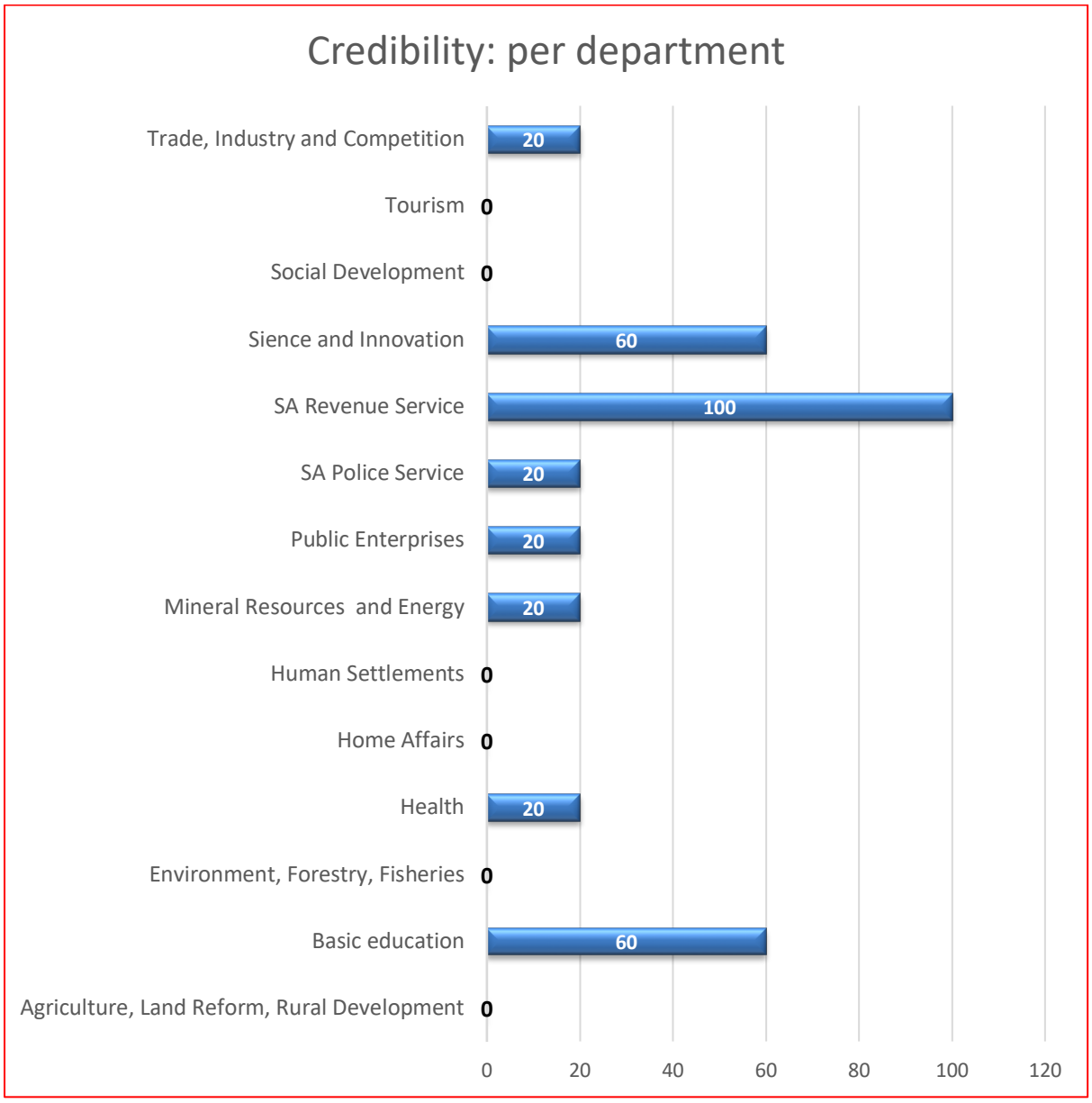

Figure 5.7 – Credibility per department

With the exception of South African Revenue Service (SARS) the credibility factor paints a dismal picture.

The credibility variables presuppose level 2 and level 3 usage of internet technology. Because these include personal transactional interactions between a citizen and the government, aspects such as privacy, security and error management become very important. Website guidelines are needed to help the user negotiate a particular electronic process correctly.

As none of these are required at a level 1 use of internet technology, it is not surprising that the variables are absent.

This conclusion is further supported by the next variable (which was added to DEWEM with the purpose highlighting the importance of measuring technology levels).

5.7.3 Level of internet technology

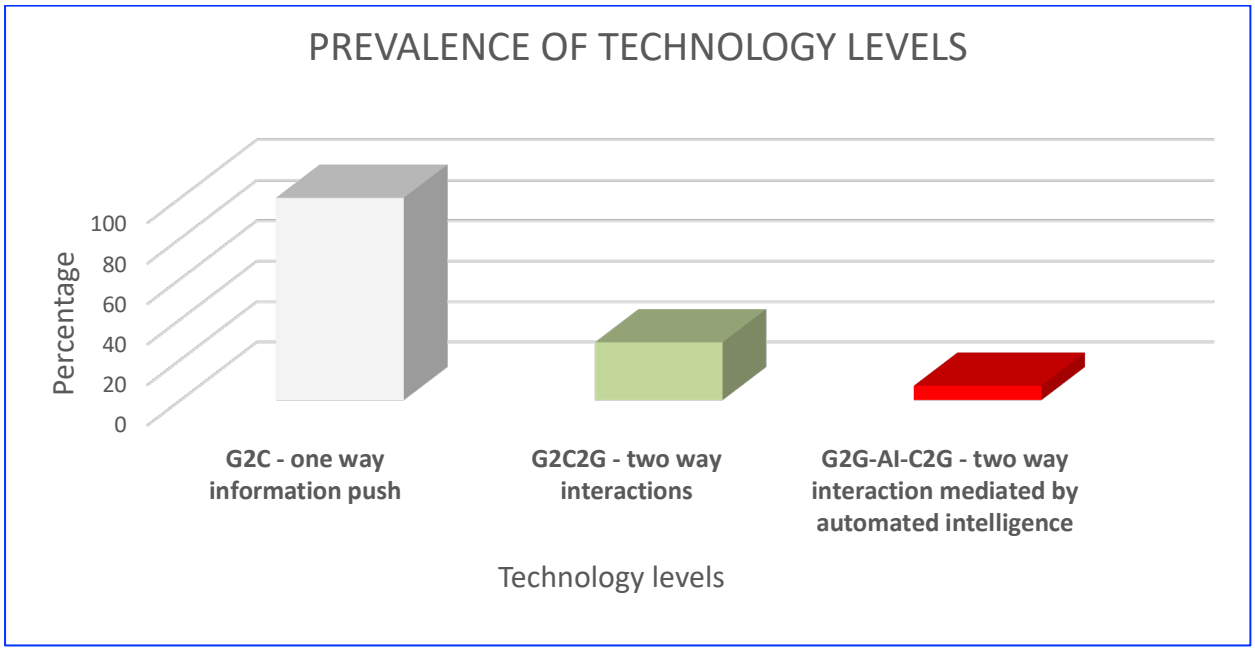

Figure 5.8 – Prevalence of technology levels

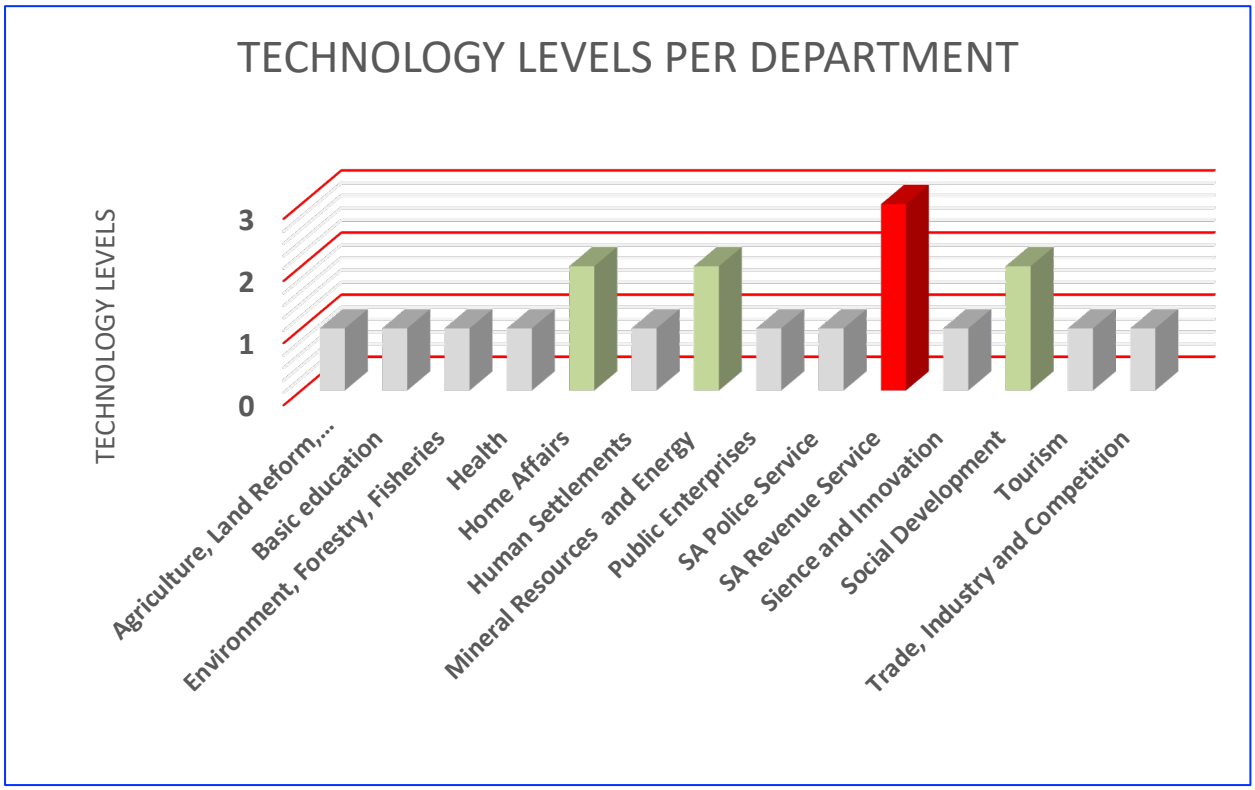

Figure 5.9 – Technology levels per department

The above graphs confirm the conclusions in the previous sections. The only website that clearly demonstrates the use of level 3 technology is the one of SARS. But SARS can hardly be seen as a departmental website. It is in the nature of SARS to be compared with financial institutions such as banks, and to expect similar use of contemporary technology.

Only 3 other departments qualify – and all of them strictly speaking only partially – as illustrations of the use of level 2 technology.

The above graphs confirm previous observations that the bulk of government departments hold only a level 1 web presence. Correspondingly, a host of services, as well as communication opportunities are not available to the majority of departments.

5.8 Results from the dimension of citizen engagement

5.8.1 Efficacy of citizen participation

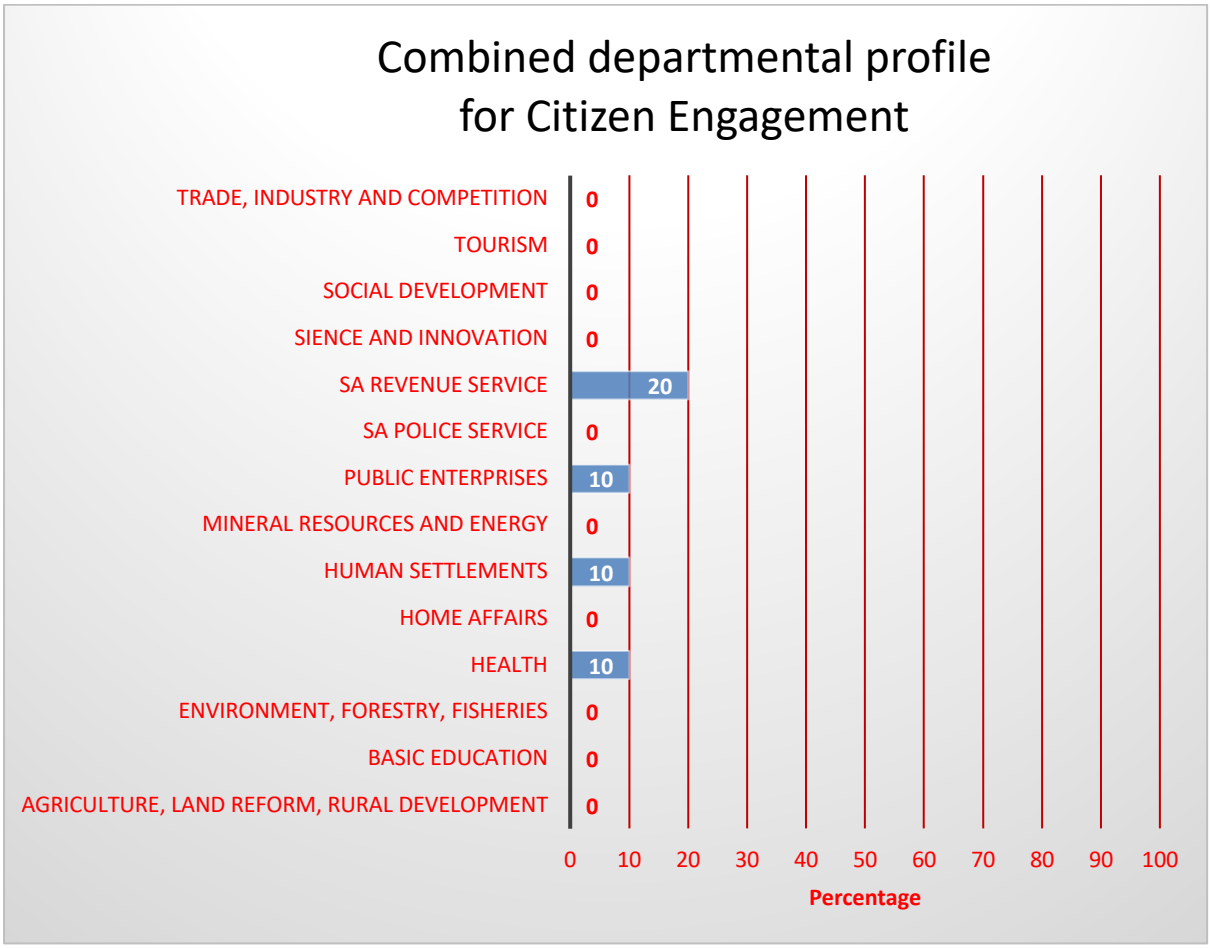

Figure 5.10 – Combined departmental profile for citizen engagement

The citizen engagement dimension hinges on two factors. Firstly, there must be clear managerial orientation toward using the governmental websites as sites of active two-way

communication. In this communication, citizen initiation of communication must be accepted and welcomed. Secondly, 2nd and 3rd level internet technology must be mobilised, without which such communication cannot happen.

It is not possible to infer from the data in this dimension whether there is in government an appreciation of such communication. But the data clearly indicates that very little of this sort happens. In light of the findings in 5.7.3 nothing else could be expected. A website presence that operates virtually entirely at level 1 simply cannot offer a platform for meaningful citizen participation.

The graphs below clearly show how barren the cupboard is on all the metrics in this dimension.

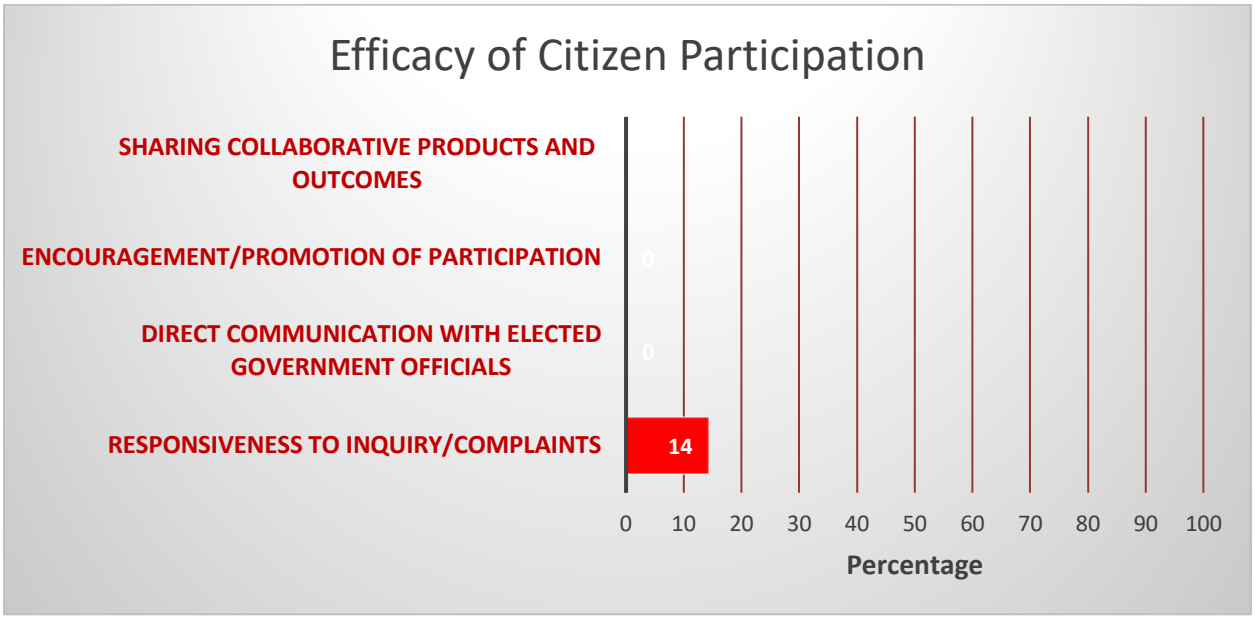

Figure 5.11 – Efficacy of citizen participation

5.8.2 Deliberation

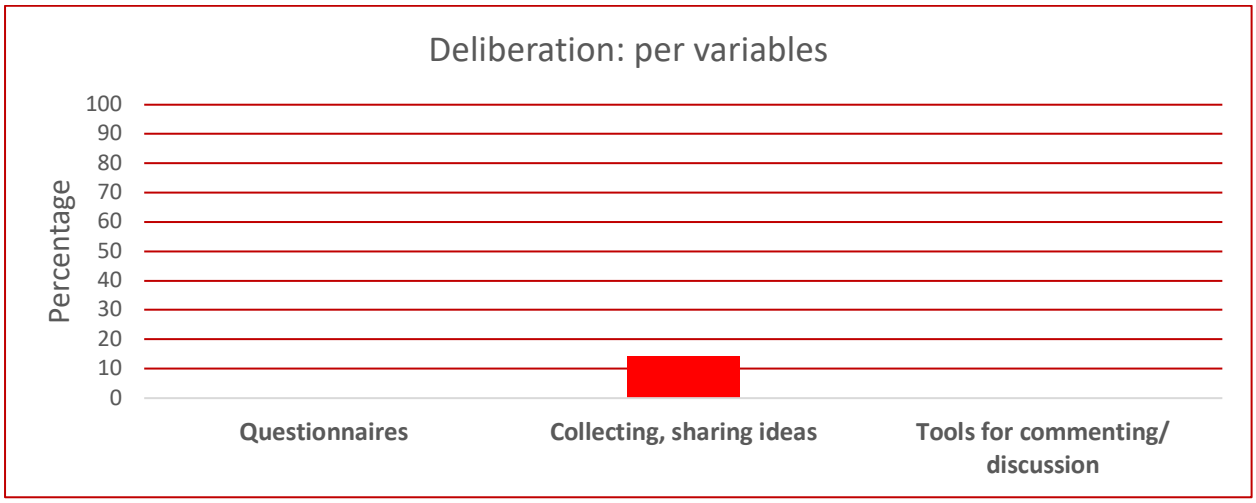

Figure 5.12 – Deliberation per variables

5.8.3 Collaboration

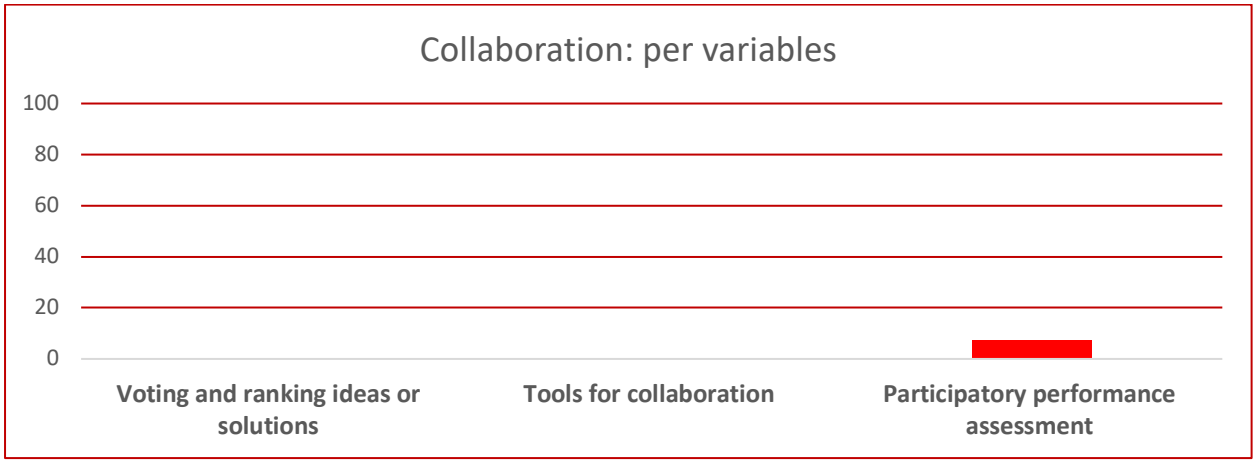

Figure 5.13 – Collaboration per variables

5.9 Conclusion

In this chapter the adaptation of the DEWEM framework into an instrument for the purpose of analysis as required in this thesis, was described.

Thereafter the findings of the application of the instrument to a select number of governmental departments were presented in graphic format.

In the next chapter the most important inferences that can be made on the basis of the data, will

be presented and the implications discussed.

Chapter Six

Electronic Governance in national government

6.1 Introduction

This chapter discusses the most important conclusions that can be drawn in light of the data that was presented in the previous chapter.

Before proceeding with the evaluation, it is necessary to note a few points:

Firstly, it must be repeated that the focus of this thesis is on the use of websites on the WWW by the national government of South Africa, specifically from the perspective of *governance*. The evaluation, therefore, does not pay particular attention to the technical aspects of the websites. The question is, does government succeed in using the facility to govern? This may be formulated differently as: does the government succeed in using websites to deepen and develop democratic practices (in government and in society) as well as possible?

Secondly, it must also be repeated that the evaluations relate only to the *public* web presence of each department. It is not possible to investigate the internal usage of internet technology inside a department. And the use of other modes of public communications, such as social media and WhatsApp's, was not targeted in the thesis.

Thirdly, it should not be assumed that a website which is rated highly for its advanced use of internet technology would be experienced by users positively. Conversely, it should not be

assumed that a website which is rated low on the basis of DEWEM will necessarily be experienced negatively by users (unless such a user experiences problem with the basic functioning of the site). It might well be an instructive undertaking to do a large-scale user expectation study in this regard, but that falls outside the scope of this thesis.

Fourthly, it needs to be repeated that any interpretation, even if steered and focused by a rigorously constructed framework such as DEWEM, always includes subjective elements. Websites are texts in the sense of the methodology of textual and content analysis. What is important is not to try to be fully objective, but to provide credible motivation for interpretive choices that are made.

Against this backdrop, this chapter starts with a summary of the evaluative observations made in the previous chapter. It then zooms in on selected variables in order to create a filtered picture of the governance profile that can be derived from the data. Thereafter, a wholistic comparison with the OECD ideal of open data flows is presented. Finally, the question is asked how much improvement can be seen in the 20 years since the study by Korsten and Bothma.

6.2 Summary of initial findings

The analysis of the primary data yielded the following insights:

a) The way the overall structure of the national government's websites is set up, makes the operation of each a stand-alone product. The layout and basic features show some consistency, but there is no interoperability between them, or any other government entity.

b) Content analysis of the departments (but not of SARS) shows that the information that is offered by the various websites, centre in the first place on formal documents and personalities. The formal documents are largely derived from annual reports to parliament and strategic plans. The personalities are mostly the relevant ministers and directors general.

c) There is far less emphasis on utilising the website as a medium of service *delivery*. Delivery in the majority of cases seems to be equated to the posting of documents that users might seek from the department, which may be downloaded for completion. But in the minimum of cases can documents be uploaded via the website.

d) In terms of basic functionality and aesthetics the websites cannot be

faulted, but in both cases the standards against which the sites have to be measured are standards of two decades ago. Only 3 departments show limited capability to operate at level 2 of internet technology standards. SARS alone operates at level 3, but it is not a departmental website and its services cannot be compared to those expected from government departments.

e) The counter side of the fact that the general approach to the websites seem to view them as sites for information on formalities and personalities, is the lack of citizen orientation. This is glaring in:

i. the absence of language options other than English, despite the equal constitutional status of all official languages

ii. the virtual absence of dedicated mobile connectivity, using secure mobile applications (with the exception of SARS)

iii. the very low score in the dimension of citizen engagement

iv. the absence of level 3 technology in all departments (except SARS), and the virtual absence of level 2

6.3 Specific analyses

6.3.1 The websites and democratic governance

In this section the attention is specifically on the primary focus of this thesis, i.e. democratic governance.

For this purpose, some filters were applied to the database.

In figure 6.1 all technical and functional variables were filtered out to leave only variables that contribute to an understanding of the substance of the websites in relation to the focus on democratic governance. In figure 6.2, the same data is expressed as a percentage per department of compliance with the filtered variables.

When viewed per variable it is immediately clear that no factor that overtly promotes democratic values, scores above 10%. Factors that score significantly are those that, useful as they are in themselves, convey formalised information about government. But this is a one-way communication as all avenues for citizen response are absent.

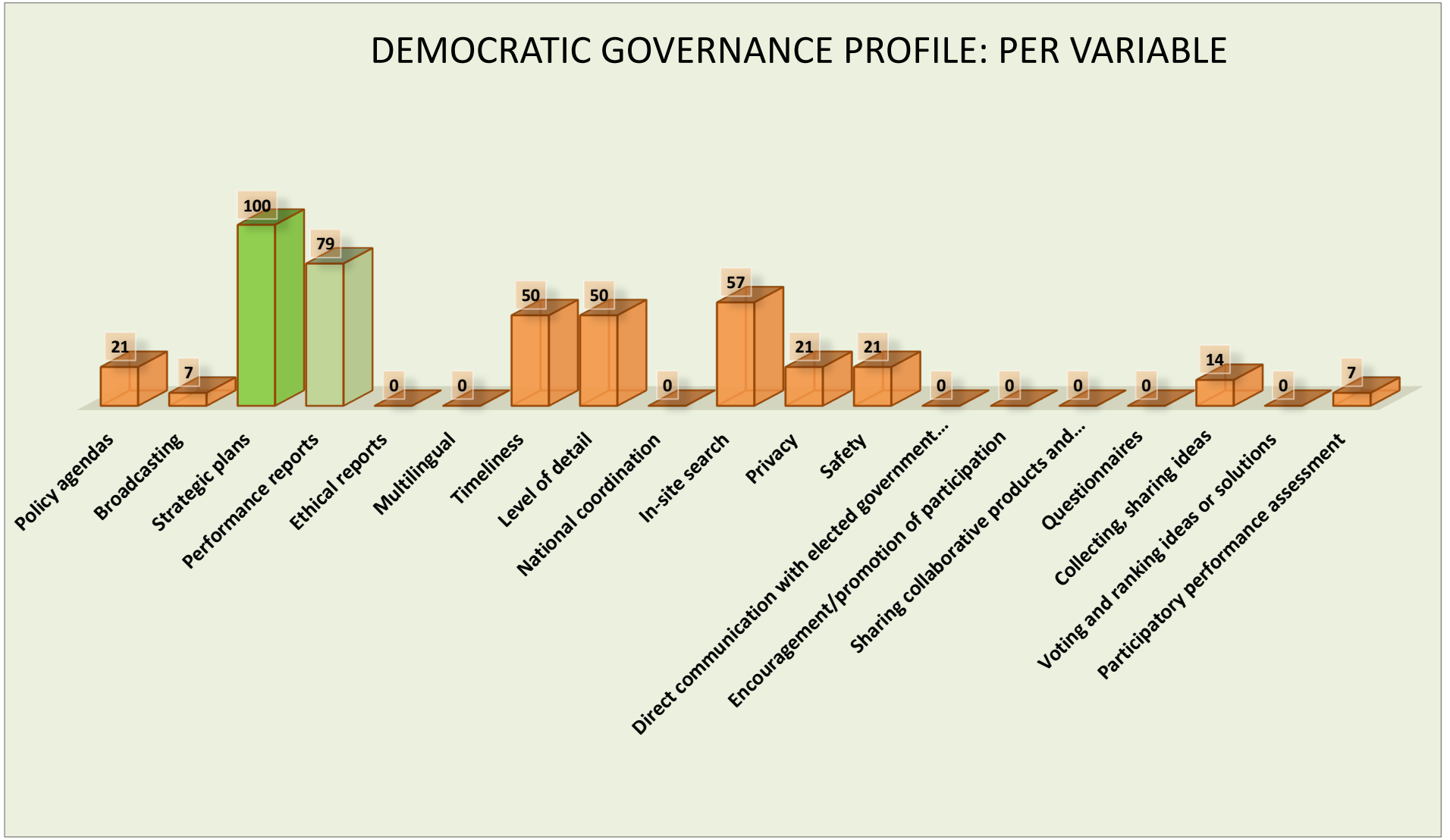

Figure 6.1 - Democratic governance profile: per variable

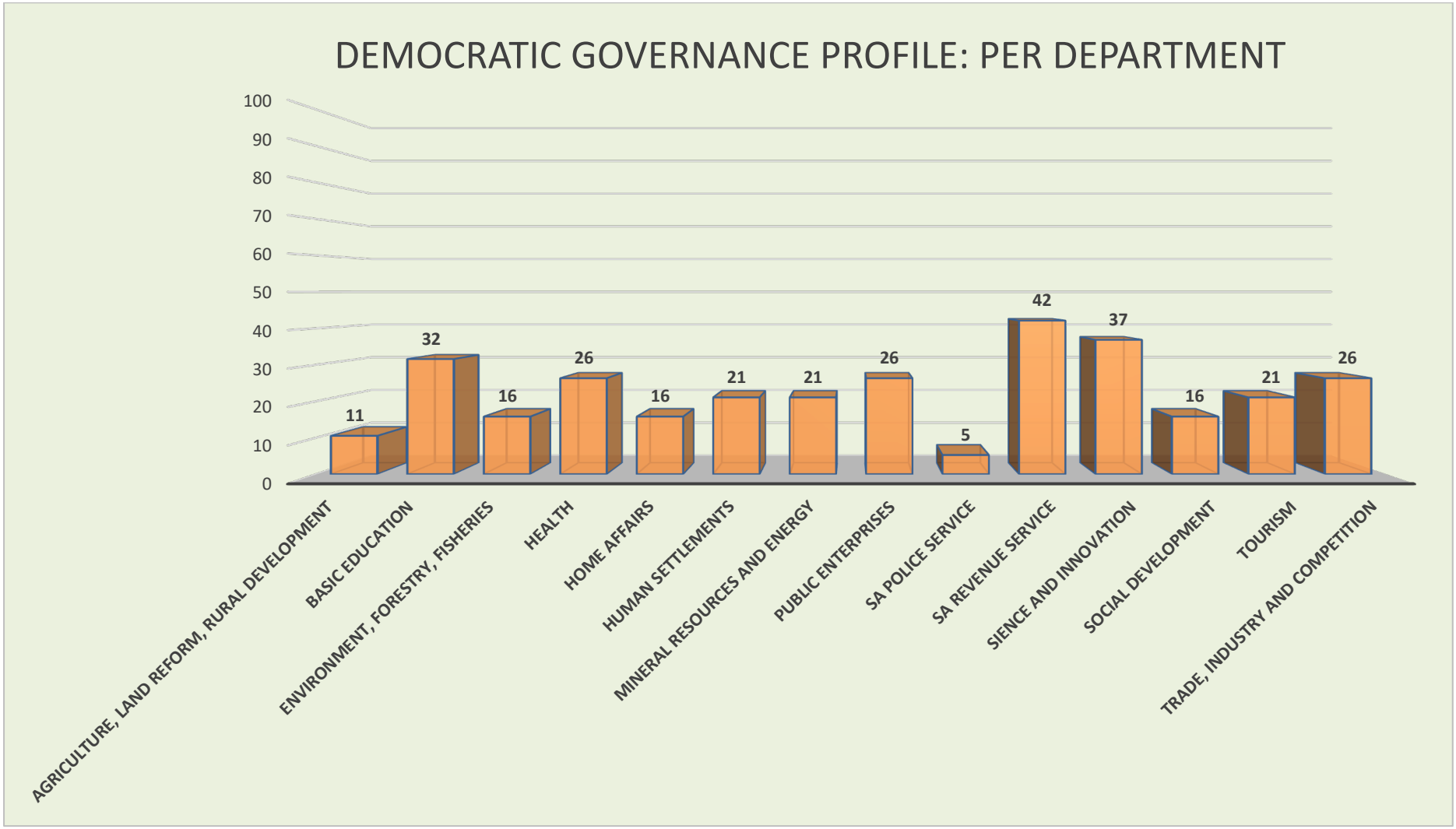

Figure 6.2 - Democratic governance profile: per department

When the same data is cast per department the extent of underperformance of the website usage in terms of democratic governance is clear. It cannot be argued that the selected websites function as tools for government and citizens to broaden and deepen democracy.

6.3.2 Substance versus functionality

To try to gauge the impact of low level of democratic governance in terms of the measurement framework of DEWEM two series were compared per department (but excluding SARS).

The first series in beige in Figure 6.3 consists of an average compliance of departments with all factors of DEWEM. The second series in blue is the same factors minus the data from internet technology and the entire third dimension of citizen engagement.

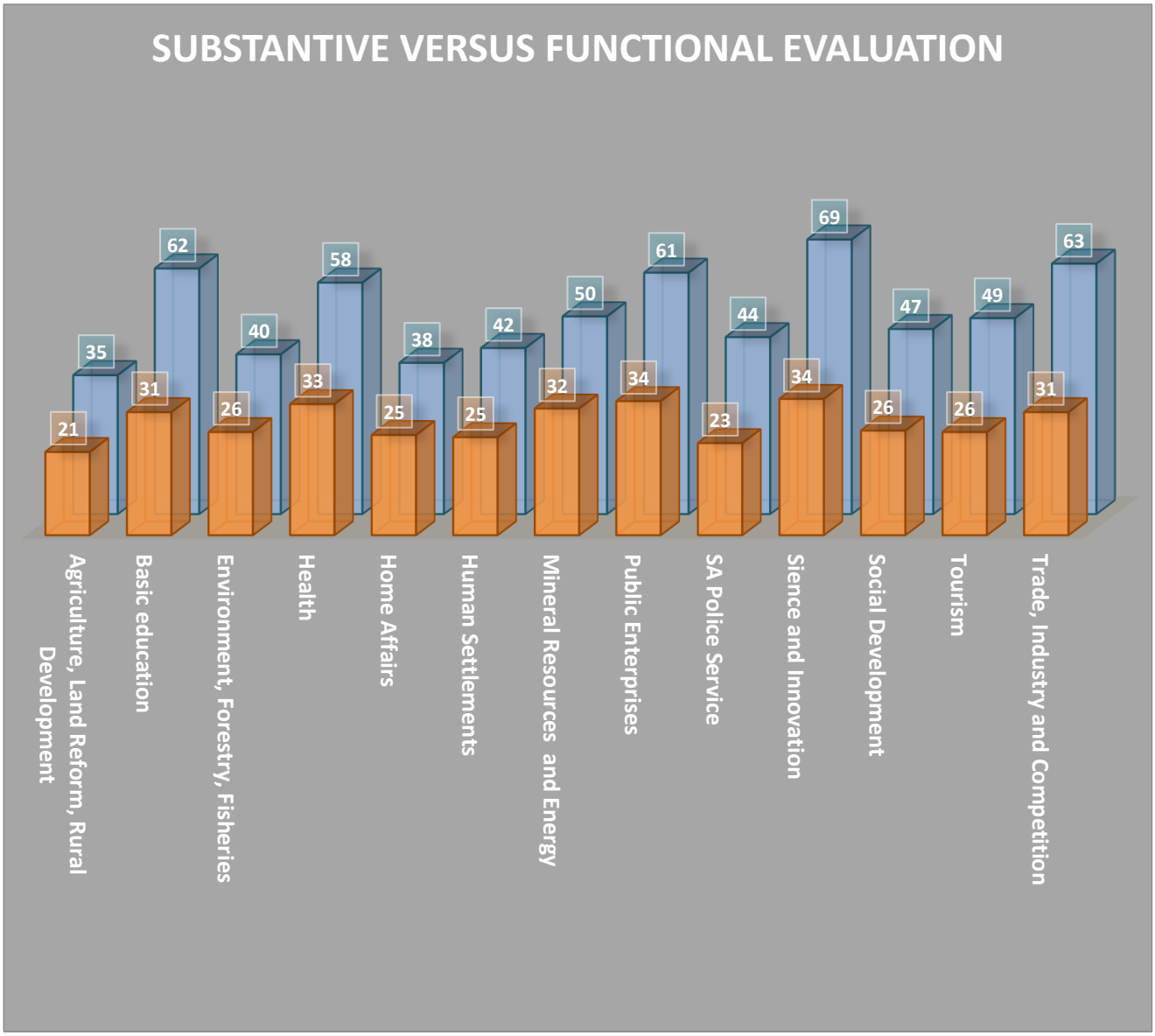

Figure 6.3 - Substantive versus functional evaluation

Not surprisingly the second series outrank the first series significantly in all departments.

Had the thesis applied a measurement instrument that was only focused on functionality, the overall profile would have been similar to the blue series.

The difference between the two series may be described as the difference between a focus on substance in the websites, and a focus on formalities, functionality and personalities.

6.3.3 The hierarchy of segments

The unequal use of the websites can be illustrated by ranking the segmental components of the DEWEM framework. This was achieved by calculating the average score for all departments combined per segment – but excluding the segment on internet technology. The result is shown in the segmental ranking below in Figure 6.4.

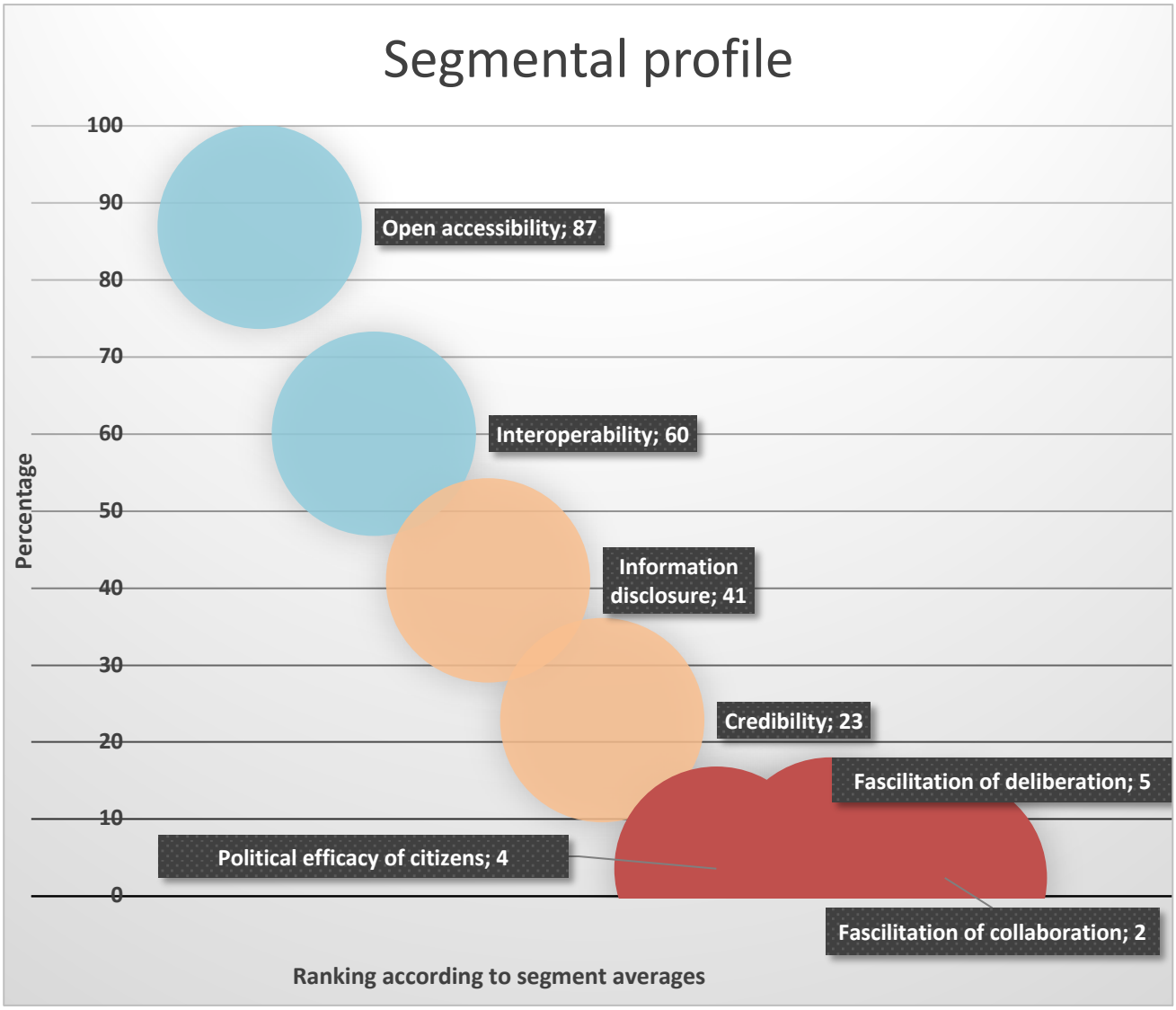

Figure 6.4 – Segmental profile

The blue spheres indicate the prominence of technical functionality. The beige spheres represent measurements of the quality of information, and the red spheres show the near absence of citizen participation.

This graph must be interpreted as strongly supporting the interpretation of the data as presented in Figure 6.3.

6.3.4 Variables at opposite poles

As a final way to determine the character of the analysed websites, those variables that scored 85% and more were compared to the variables which scored 15% or less. In this way the extremes can be better identified.

From table 6.1 it easily be seen that the top scorers are all of a technical and functional nature. Virtually all bottom scorers are factors that impact the substance of content and usage of the websites. Interestingly, information disclosure does not feature in either column.

Top 15% variables	
Non-discriminatory	100
Open license	100
Free of charge	100
Non-proprietary	100
System availability	93
Strategic plans	100
Navigational structure	86
Content organization	86
Resolutions	86
Laptop/ PC's vs Phones	93
Page loading time	100
G2C - one way information push	100

Bottom 15% variables	
Broadcasting	7
National coordination	0
Language choices	0
Website guidelines	7
G2G-AI-C2G - two way interaction mediated by automated intelligence	7
Responsiveness to inquiry/complaints	**14**
Direct communication with elected government officials	**0**
Encouragement/promotion of participation	**0**
Sharing collaborative products and outcomes	**0**
Questionnaires	**0**
Collecting, sharing ideas	**14**
Tools for commenting/ discussion	**0**
Voting and ranking ideas or solutions	**0**
Tools for collaboration	**0**
Participatory performance assessment	**7**

Table 6.1 - Top 15% variables and bottom 15% variables

6.4 The findings in light of the OECD (OUR)data model

The findings of the analysis if the selected websites make it very clear that the South African state of E-Gov is very far removed from the OECD ideal.

The OECD model revolves around a continuous and almost free flow of *data* to and from government agents. Such a free flow allows citizens to consume the data, to experiment creatively with it and to feed results back to government. The critical factor in this case is that government makes current *data* available, if not totally then in almost totally real time.

By contrast, the websites that were analysed make *documents* available. In fact, the majority of documents are historical and produced for formal reporting. They are posted to inform the public. Information and documents in this sense are not data in the OECD sense. Documents can be downloaded and discussed, but they cannot be processed as data. There may be processable data in some documents, but when they are disseminated in documentary format it is tiresome and cumbersome to convert them to digital formats that make data analysis and data analytics possible.

Technologically it is, of course, predetermined that South African websites will fail to measure up to the OECD model. Such a model is totally dependent on sophisticated *systems* that are interoperable. It was noted above that the websites analysed in this study only showed interoperability internally. But that id a far cry from system operability – between departments, perhaps sourcing from the same database, and between government and citizens, perhaps linking to citizen databases too.

The OECD model further requires at least level 2, and often level 3 internet technology. This must be operational across all departments and the systems that combine them. It is only with such technological background that a free flow of data form which value is derived through the processing of such data, can be achieved. The findings of this thesis show that such a backdrop does not exist in South Africa. Where it can be observed, it is restricted to a department. Once again, the silo structure of the national government's web presence is evident.

It is quite clear that the South African government's web presence will only be in a position to move in the direction of the OECD model if fundamental changes, both technologically and managerially, are implemented. Such changes will have to aim, preferably, to achieve a systemwide use of level 3 internet technology as a platform for a systemic interoperability.

Such a development will signal a categorical improvement in the government's subscription to democratic governance.

6.5 Evaluation of the information model

As it is, the South African government's web presence is built on level 1 internet technology. As indicated, this means mostly only a one-way flow of information. This must not be confused with the focus on data as discussed in the previous point.

Since this is at present the only use that can be expected of most governmental websites, the question must be asked about the quality of information flows.

The implication of Figure 6.4 and Table 6.1 above is that the provision of information in the analysed websites is neither good nor bad. However, when the findings on information disclosure as depicted in figures 5.2 and 5.3 are added to the considerations the scale tilts toward the negative. The analysis has shown that the websites score high for technical and presentational aspects of information, but when substance (including relevance and timeliness) are investigated the results lag.

As to whether this is a result of managerial tardiness or deliberate policy decisions, this thesis cannot provide any insight. To answer such questions requires a very different type of study. But from the point of internet technology it can be said that it is very difficult to maintain timely and up to date websites on the basis of level 1 internet technology. To maintain running updates, requires a large compliment of staff and has to be done predominantly manually. It is also very costly. Consequently, such websites (if they are maintained) usually end up with collections of attached documents which are easier to change if necessary. It is no surprise then that the majority of the analysed websites are populated in this way. That is more or less the best that can be done at level 1 of internet technology.

If this situation is viewed from the perspective of governance, it is clearly far from ideal. In the 21st century people are used to virtual immediate access to information, which is generated virtually as things unfold. It is not in government's favour to be seen as "behind the times".

6.6 Citizen engagement

The total lack of meaningful citizen engagement via the government's websites has been demonstrated in many ways above. It has also been pointed out that such an engagement presupposes a systemwide web presence at level 2 and preferably level 3 of internet technology.

This failure hurts many people, but probably the marginalised and the poor the most. It is no longer the case that a small number of the population have access to the WWW. The penetration of smartphones has been remarkable over the last decade. May poor households have some access today to the web. With fully transactional websites, in all official languages, such people

can be serviced much more easily and cost effectively for them. That this is possible is evident in the success of many banking applications, the widespread use of Whatsapp and even the broad use of Facebook on mobile phones in townships.

It is not only that services may be more effective. It is also that government deprives itself of the opportunity to reap feedback and inputs from ordinary people on an ongoing basis. That can only strengthen governance.

6.7 Looking back to Korsten and Bothma

In 2.3.1 a summary of the findings of Korsten and Bothma after analysing the then *South Africa Government Online* website. This study was done 20 years ago. Since then the government's web presence has grown considerably, not least because of the expansion of government departments and agencies.

As this was the last known study of national government websites in South Africa, it is important to ask how much progress has been made. The Korsten and Bothma study resulted in recommendations that can summarised, using DEWEM terminology, improving accessibility, interoperability and information disclosure.

As far as accessibility, the DEWEM based analysis in this thesis indicates improvement, probably to the extent that Korsten and Bothma had in mind. Of course, back then level 2 of internet technology was in the emerging stage, and it is not possible to guess what improvements they would have suggested had they had the benefit of seeing the future evolvement of the technologies.

However, as for interoperability and information disclosure clear improvement cannot be stated. The following quote from their paper could just as well have been written today, given the findings of the analysis in this thesis:

> "Strong emphasis was placed on the presentation of departmental organizational structures and activities, and especially the provision of documents, speeches and media statements, in contrast to the presentation of projects and programmes and value-added features such as Frequently Asked Questions (FAQs), site maps, indexes and interactivity features. Some government departments started to provide some services online, but they were still far from becoming true online service providers at the time of the audit."[180]

[180] Korsten H, Bothma TDJ. 2005. Evaluating South African government Web sites (Part 2), 3

6.8 Conclusion

The findings of this thesis show that the websites of the national government of South Africa is a hostage to the restrictions imposed by level 1 internet technology. The extent and implications of this restriction are clearly shown in the various findings of the analysis.

But it will be very unfair and baseless to claim that the findings discussed here apply to the totality of the government's web presence or governance. Unlike 20 years ago the use of the internet has spread to many areas of which some may not even have been anticipated then. In particular the explosion of social media has changed the ecology of communication and service delivery. The growth of computational power and capacity, in particular such capacities that are associated with level 3 of internet technology, as discussed in chapter 4, has made integration of technologies such as GPS and satellite feed with the WWW possible.

A study, therefore, that restricts itself to a select number of websites, cannot claim to paint a comprehensive picture of the government's use of the internet. It can only claim that, as far as the government's presence on the web of departments of national government is concerned, there is considerable catch-up to be done. And, in light of the wealth of literature on electronic governance, the study can claim that if the government catches up, it and the citizens will benefit significantly.

However, there is one more claim that this thesis can make. The instrument of analysis that was developed here, rooted in the DEWEM framework, has proven to be a useful instrument to assess websites. It standardises perspectives on websites, and thus makes comparability possible. For the same reason it can be used at any level of government, from national to local and also for para-governmental organisations.

Ideally a similar instrument – that is one focusing on governmental governance by means of the internet – for assessing electronic governance from the point of view of citizen experience and expectations, should be developed. A combination of such an instrument with the DEWEM based one will be a powerful tool to help improve democracy, governance and good citizenship.

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